

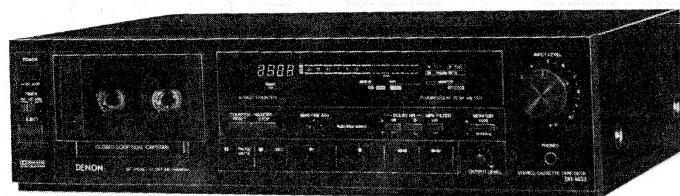
# DENON

Hi-Fi Component

## SERVICE MANUAL

### STEREO CASSETTE TAPE DECK

**MODEL DR-M33/DR-M44**



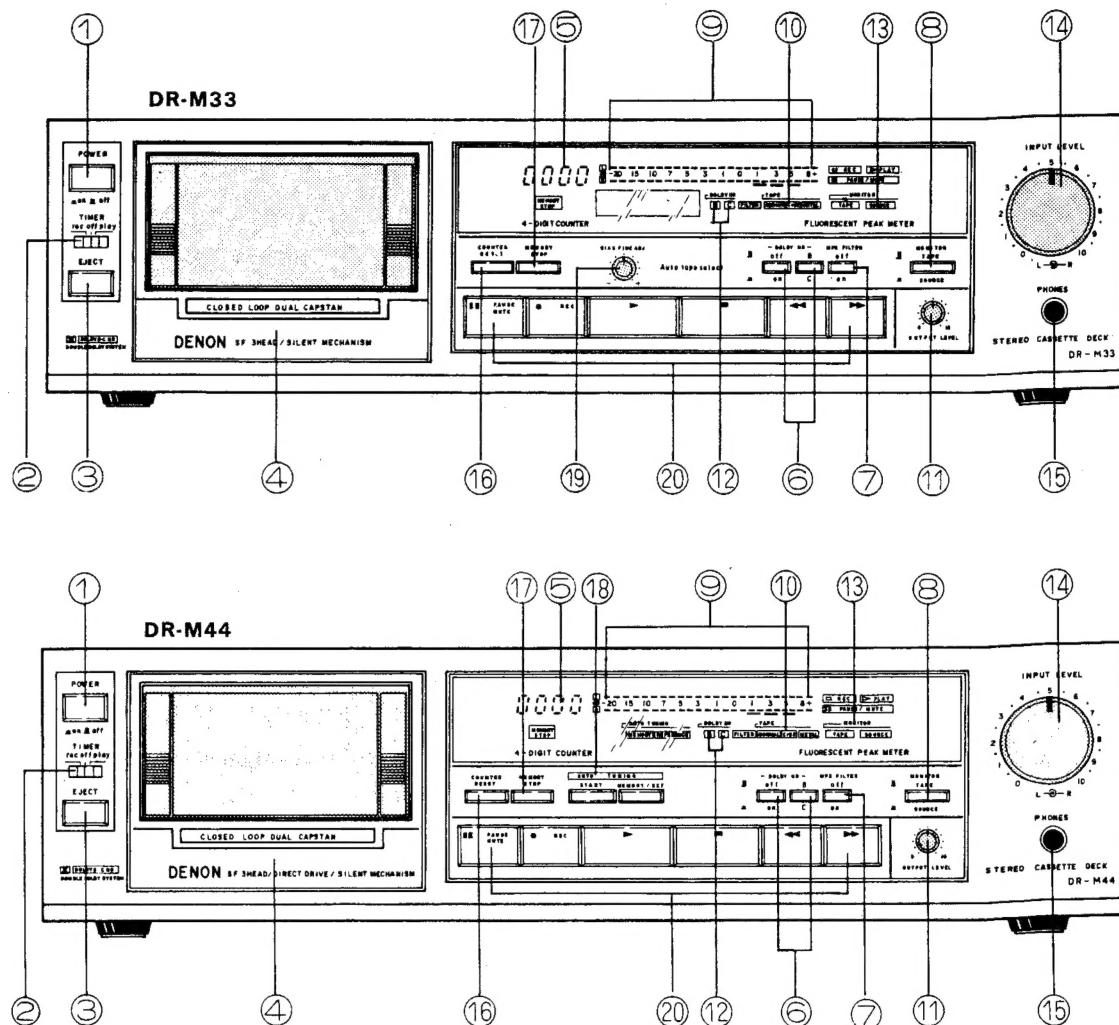
DR-M33



DR-M44

**NIPPON COLUMBIA CO., LTD.**

## PART NAMES AND FUNCTIONS



### 1. POWER switch

Controls the supply of AC power to the deck. One push turns the deck on, a second push turns it off. The deck remains in a stand-by (non-operative) mode for approximately 4 seconds after it is switched on.

### 2. TIMER switch

This switch is provided for use with an optional audio timer for unattended recording or morning-alarm playback. For non-timer operation, this switch should be set in the "off" position.

### 3. EJECT button

Press this button to eject the cassette. When the deck is operating (tape is running), press the stop (■) key first to stop the tape transport; then press the eject button.

### 4. CASSETTE COMPARTMENT COVER

If this compartment cover is not closed completely, the deck's transport controls will remain inoperative.

### 5. TAPE COUNTER

A four-digit readout indicates the present tape count position.

### 6. DOLBY NR switches

The left Dolby NR switch activates (in) or deactivates (out) the deck's Dolby noise reduction circuitry. The right switch selects between Dolby B-Type (out) or C-Type NR (in).

### 7. MPX FILTER switch

The MPX FILTER switch should be used to prevent interference with the Dolby NR circuit when making Dolby NR encoded recordings of FM stereo programs. When making Dolby NR encoded recordings from any program source other than FM stereo, leave this switch in the "off" (out) position.

### 8. MONITOR switch

The SOURCE (in) position of this switch allows you to

monitor the source program before it is recorded. The TAPE (OUT) position of this switch is used for tape playback monitoring or simultaneous monitoring during recording.

## 9. FLUORESCENT PEAK METERS

These meters indicate recording or playback peak levels for each channel. For peak levels exceeding -1dB, the Auto Peak Hold Feature holds the peak level reading for approximately 1.5 seconds.

## 10. TAPE SELECT indicator

This indicator light is interlocked with the Auto Tape Select feature which automatically adjusts the deck to the type of tape in use. (NORMAL, CrO<sub>2</sub>, or METAL).

## 11. OUTPUT LEVEL control

This control adjusts playback, recording monitor, and headphones output levels for the both channels simultaneously.

## 12. NR SYSTEM indicator

This indicator light is interlocked with the Dolby NR switch and informs the user that Dolby NR is in use as well as which (B or C) Type.

## 13. MONITOR indicator

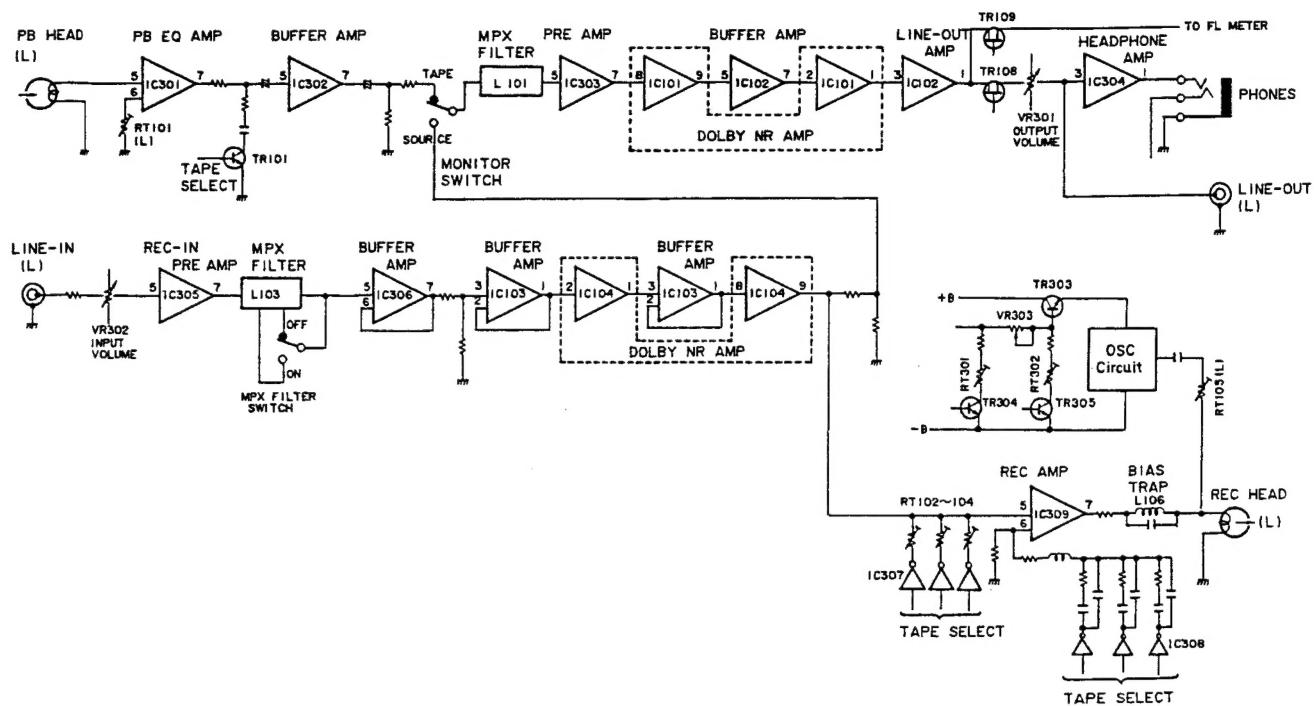
This indicator light is interlocked with the MONITOR switch to inform the use of the selected monitoring source – TAPE or SOURCE.

## 20. Tape Transport Controls

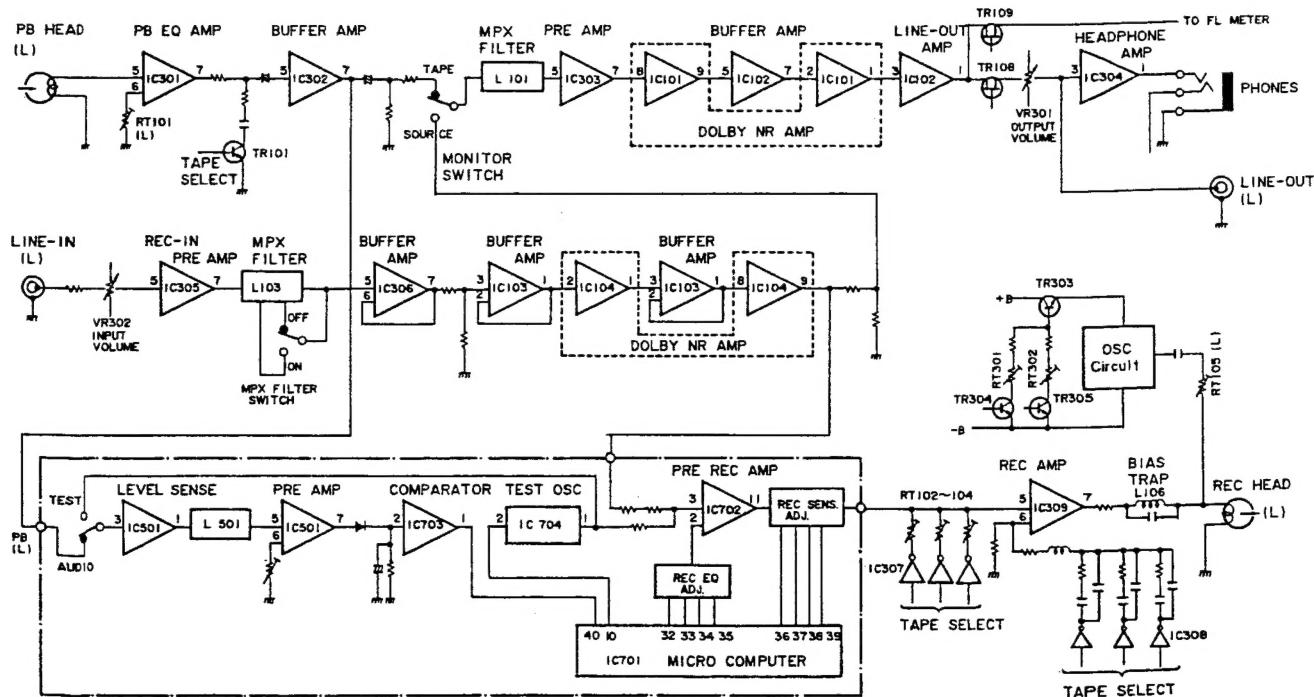
|               |                   |  |
|---------------|-------------------|--|
| ►             | ► PLAY KEY        | Press to playback tape.  |
| ■             | ■ STOP KEY        | Press to stop tape in any mode.  |
| ◀◀            | ◀◀ REW KEY        | Press for fast rewind.   |
| ▶▶            | ▶▶ FF KEY         | Press for fast forward tape winding.   |
| ● REC         | ● RECORD KEY      | To begin recording, press the RECORD and PLAY keys simultaneously. If only the RECORD key is pressed, the deck is placed in the REC PAUSE (record standby) mode. |
| ■■ PAUSE MUTE | ■■ PAUSE/MUTE KEY | The PAUSE key causes the tape to stop momentarily during recording or to mute the recording input to create blank (non-recorded) portions on the tape            |

## BLOCK DIAGRAM

### DR-M33

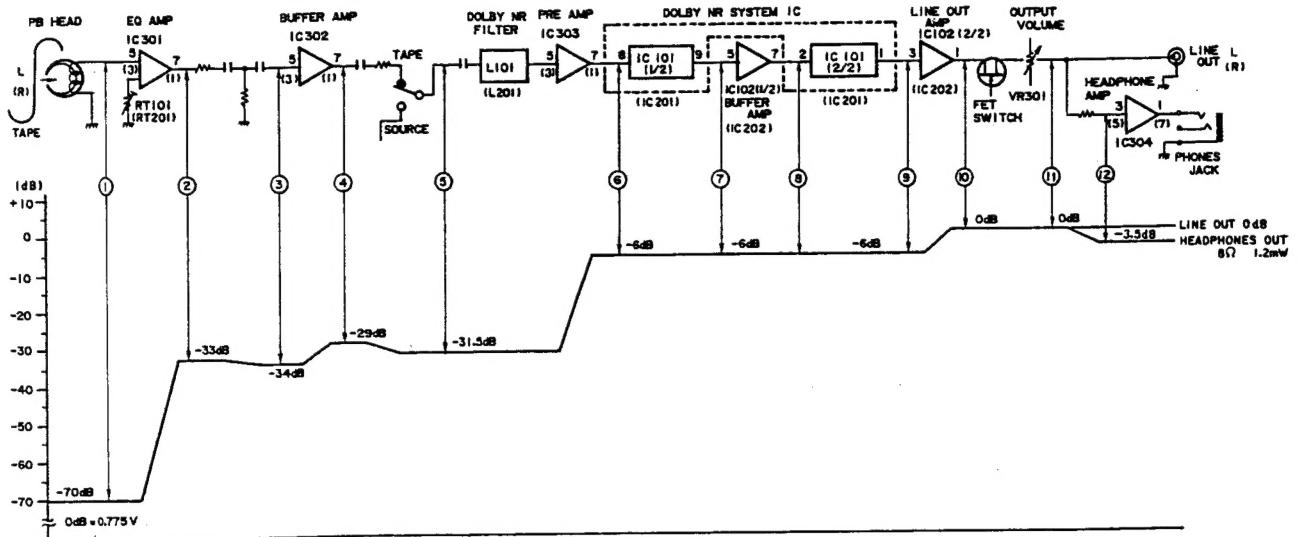


### DR-M44

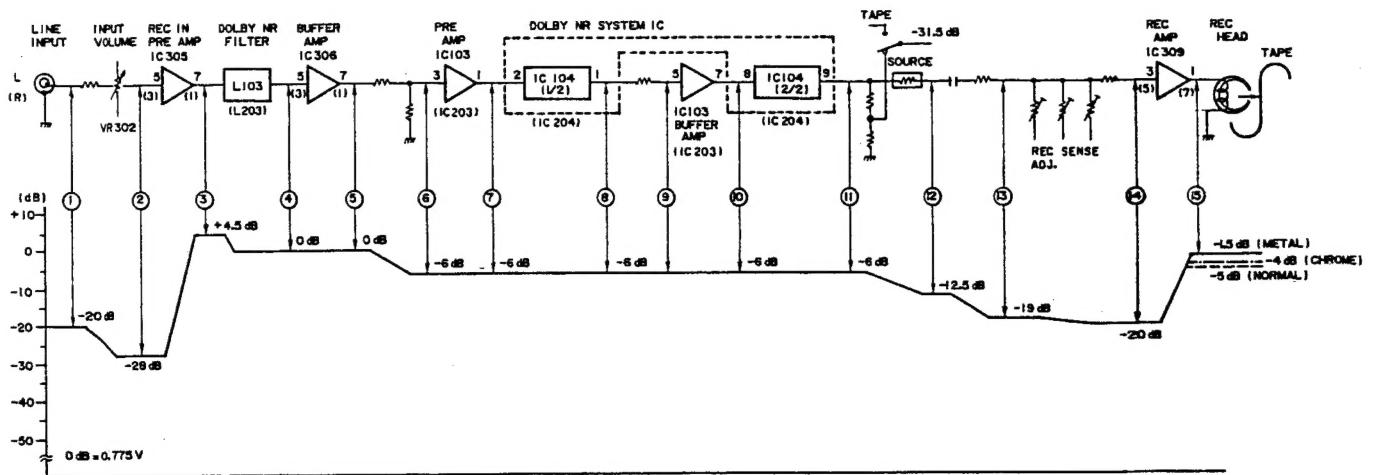


## LEVEL DIAGRAM

### PLAYBACK SYSTEM



### RECORDING SYSTEM



## ● Outline of the Mechanism Control Microcomputer

The function of the microcomputer, which is applied to the uni-directional transport cam drive control cassette deck mechanism, will receive an outside signal from the operation switch (operations such as PLAY, REC, STOP, FF) during the recognition of the current condition or from the surrounding circuits of the microcomputer (automatic tuning, linear counter, cam encoder, reel pulse, etc.) and sends the appropriate control signal.

To the mechanism: rotational direction of the reel motor, speed, stop, rotational direction of the cam motor, stop.

To the linear counter: makes an output of the mechanism run mode command (REW, FF, PAUSE, PLAY).

To the automatic tuning: REC, P/B, LINE mute signal commands. Makes an output of the BIAS ON/OFF command (CUE command).

To the display: REC, PAUSE (REC MUTE during flash). In addition, the following points are taken into consideration.

- (1) Stable and accurate cam rotation position control is required since a cam drive method is employed to make the mechanism silent. Accurate rotation position control is performed by using a cam drive with a rotary encoder detected digital feedback servo.
- (2) Since the leading time of the cam drive is slower when compared to that of the plunger method, problems will arise when attempting record/playback or stop at the designated tape position from FF or REW, since tape overrun occurs. This is especially important when controlling the recording from the position where the automatic tuning was completed.  
(Erasing the previous music when making recordings after the automatic tuning is completed must be prevented.)

For this, the tape cuing is corrected after the automatic tuning is completed to control the tape position accurately.

## (3) Power outage measures

When the power supply is cut off, the cam of the mechanism shifts to STOP.

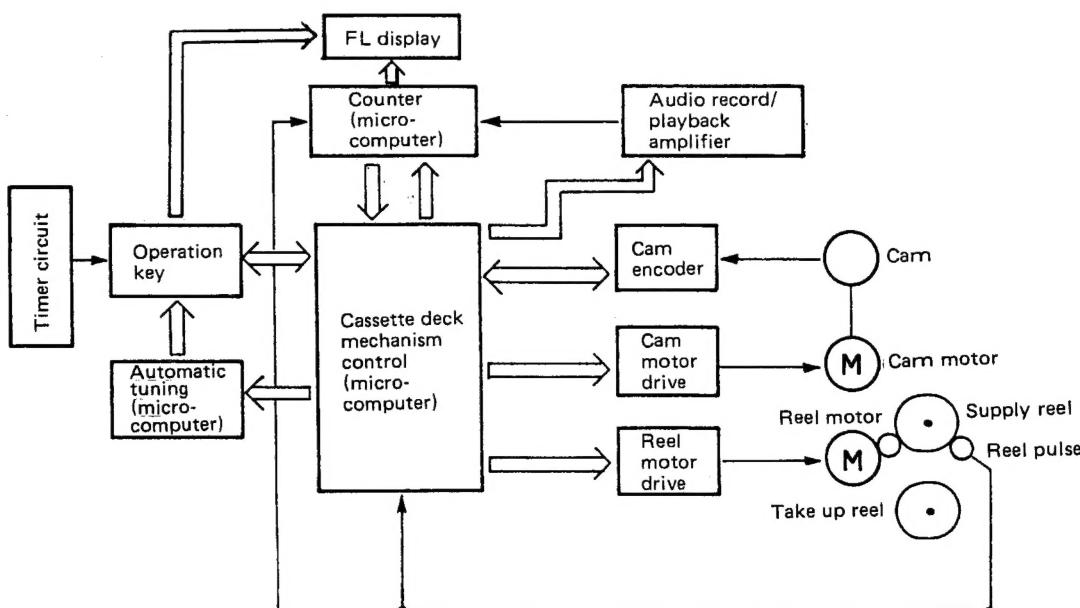
## (4) Overload measures of the cam

If the cam stops due to an overload for any reason and cannot shift to the target position within 4 seconds, it is immediately shifted to STOP. If this cannot be shifted within 4 seconds, the microcomputer will stop all controls and stop the motor to prevent a breakdown.

## ● Auto Tuning (CTS)

This tuning system automatically sets the equalizer and recording sensitivity, both of which are important to maximizing the performance of various tapes and to make high quality recordings. The tuning time is only 6 seconds; recording chances are not missed. When the cassette is loaded, the auto tape selector sets the deck to the standard optimum condition. Strictly speaking, however, the recording sensitivity and frequency characteristics of the tapes vary, depending on its type.

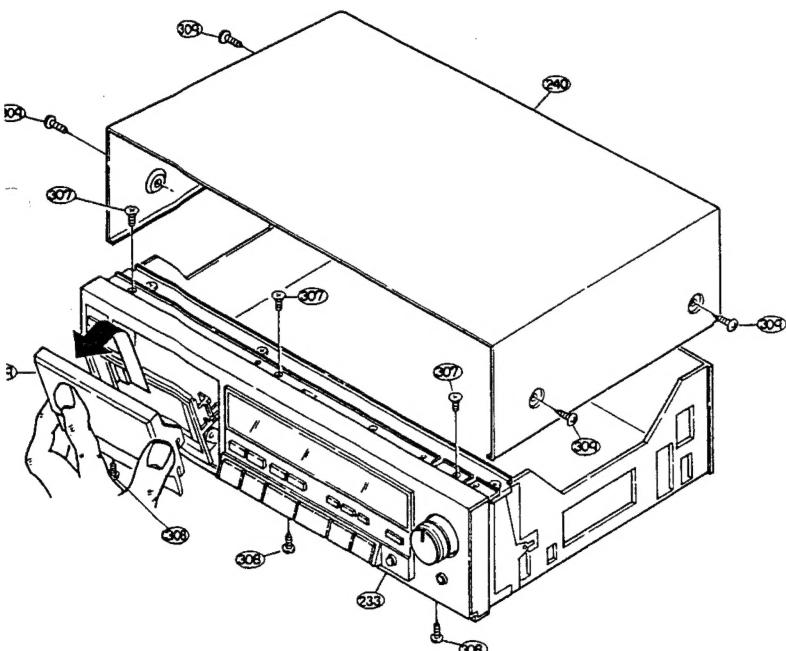
The auto tuning system allows the maximum performance of the tape to be heard and at the same time ideally corrects the frequency characteristics to a flat and wide range characteristic.



## DISASSEMBLY INSTRUCTIONS

### 1. How to Remove the Front Panel

- (1) Unscrew the 4 screws 309 from both sides of the top cover 240 and take off the top cover by pulling it up.
- (2) Press the eject knob 231, open the cassette window 239 and take off the mechanism, as shown in the diagram.
- Note:** Be careful when handling the cassette window, as it is easily scratched.)
- (3) Remove the connector (5P) with lead wires, which runs from the timer switch 234 to the rear of the logic circuit board 202, from the logic circuit board.
- (4) The front panel can be removed by unscrewing the 3 upper screws (3x8 CFTS S tight) 307 from the front panel 233 and the 3 lower screws (3x8 CBTS P tight) 308.



### 2. How to Remove the Mechanisms

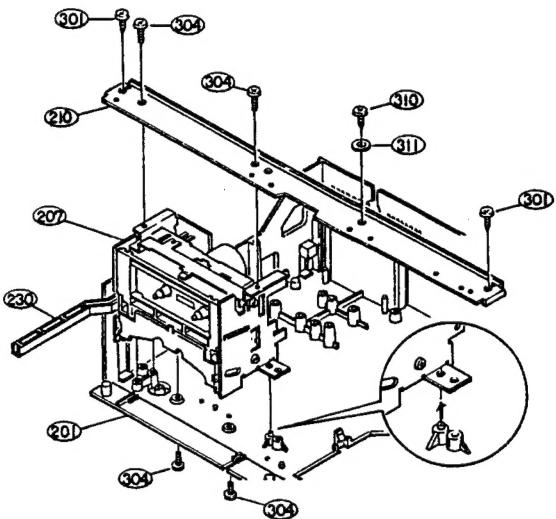
- (1) Remove the top cover 240 and the front panel 233. (Refer to section 1)
- (2) Unscrew the 2 mechanism holding screws (3x6 CBTS S tight) 304 from the bottom surface of the chassis 201.
- (3) Unscrew the 2 screws (3x6 CBTS S tight) 304 holding the angle 210 and the mechanism 207 and the 3 chassis holding screws 301, 310 and remove the angle.
- (4) Remove the connectors with lead wires, which runs from the mechanism section, from the circuit board.  
Audio circuit board side 2P connector CN101 CN201  
3P connector CN302 CN303  
4P connector CN301  
Logic circuit board side 2P connector CN2 CN3  
4P connector CN13 (DR-M44 only)  
5P connector CN10 CN11  
6P connector CN9

**Note:** When assembling, check to make sure the connectors are inserted correctly.

- (5) Pull out the power switch lever 230 from the power switch 259.
- (6) Remove the eject knob 231.

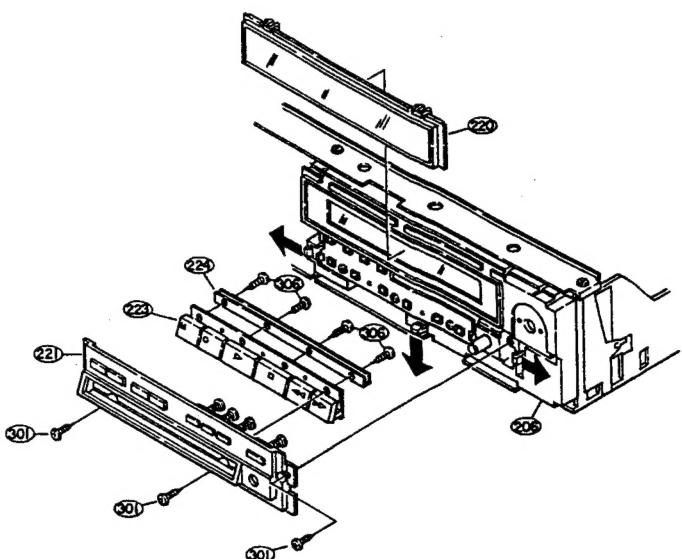
- (7) The mechanism can be removed by holding the mechanism and pulling up.

**Note:** When assembling, do so after checking to make sure the 2 stay holes on the lower side of the mechanism unit are matched with the chassis protrusions.



### 3. Removal of Front Escutcheon, Meter Window, and Control Button

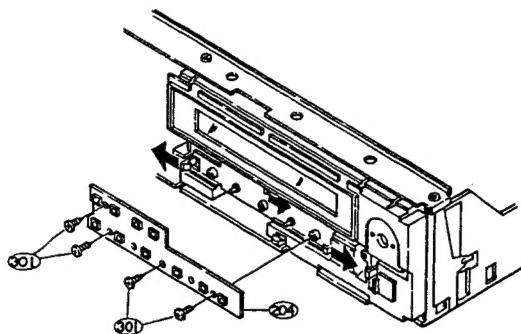
- (1) Remove Top Cover (240) and Front Panel (233). (Refer to Section 1)
- (2) Unscrew the 3 screws (3 x 8 CBTS P Tight) (301) which secure Front Escutcheon.
- (3) Front Escutcheon (221) is fixed to the Front Chassis (206) by 3 pins; located at right, left, and below, so that Front Escutcheon may be removed when these pins are removed in order of right, below and left as indicated by arrow.
- (4) Meter Window (220) may be removed after Front Escutcheon is removed.
- (5) Control Button (223) should be removed after the 4 screws (306) (2.6 x 8 CBTS P Tight) are removed which secure the Press Bar (224).



#### 4. How to Remove the Control Circuit Board

- (1) Remove the top cover 240 and the front panel 233 (Refer to section 1)
- (2) Remove the front escuchion 221. (Refer to section 3)
- (3) Remove the connectors with lead wires which run from the control circuit board 204.

|                               |                    |
|-------------------------------|--------------------|
| FL counter circuit board side | 5P connector CN404 |
| Logic circuit board side      | 8P connector CN4   |
| CTS circuit board side        | 4P connector CN701 |
|                               | CN704              |
- (4) By unscrewing 3 screw (3x8 CBTS P tight) 301 holding the control circuit board and loosening the 3 hooks on the control circuit board 204 can be removed.



**Note:** When replacing the tact switch 257, always check to make sure that it is not floating above the circuit board. If it is floating, the switch will be in the on condition when the set is assembled.



#### 5. How to Remove the FL Meter

- (1) Remove the top cover 240 (Refer to section 1)
- (2) Remove the connectors on the FL meter circuit board 205.
- (3) Remove the 2 screws (307) (3 x 8 CFTS S Tight) which secure FL Meter, Screw (310) (3 x 10 CBS), and washer (3W). Then the FL Meter may be removed.

#### CAUTION:

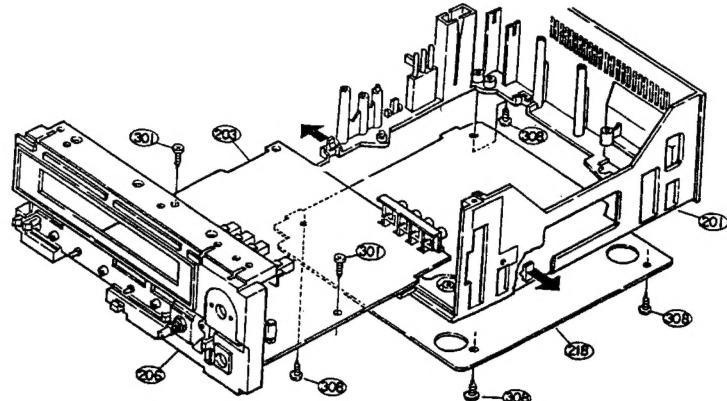
During assembly, avoid snagging the Shield Sheet (243), which is located under the Counter/Meter Circuit board (205), on the FL Meter.

#### 6. How to Remove the CTS Circuit Board (DR-M44 only)

- (1) Remove the top cover 240 (Refer to section 1)
- (2) Remove the 4P connectors from the CTS circuit board 217.
- (3) The CTS circuit board 217 can be removed upwards by pulling it upwards and loosening the 2 hooks on the chassis 201.

#### 7. How to Remove the Audio Circuit Board

- (1) Remove the top cover 240 and the front panel 233. (Refer to section 1)
- (2) Remove the angle 210 (Refer to section 2)
- (3) Remove the front escuchion 221 and the meter window 220. (Refer to section 3)
- (4) Remove the control circuit board 204, and the FL meter 256. (Refer to sections 4, 5)
- (5) Remove the CTS circuit board 217. (Refer to section 6)
- (6) Remove the connectors from the audio circuit board 203.
- (7) Unscrew the 4 bottom cover holding screws (3x8 CBTS P tight) 308 on the back side of the chassis 201 and remove the bottom cover 218.
- (8) Unscrew the screw 301 holding the Audio amp circuit board.
- (9) By lifting the front chassis 206 and loosening the 2 hooks on the chassis holding the audio circuit board 203, the audio circuit board can be removed.



#### **When Separating the Audio Circuit Board by Itself**

- (10) Unscrew the nut holding the input volume 253 and remove the input volume and the shield bracket 209 toward the rear.
- (11) Unscrew the nut holding the output volume 254.
- (12) Remove the spring plate holding the headphones jack 255.
- (13) By removing front chassis 206, the audio circuit board can be removed by itself.

**Note:** Most repairs to the audio circuit board can be performed by removing the bottom cover on the chassis. Refer to the above procedure only when necessary.

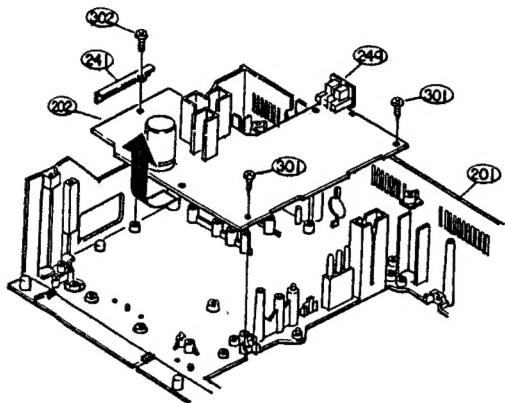
When reassembling, follow the procedures in reverse order; however, if each of the various parts are not assembled properly in their respective position, the set cannot be assembled. When assembling, check the work of each step carefully.

#### **8. How to Remove the Logic Circuit Board**

- (1) Remove the top cover 240. (Refer to section 1)
- (2) Remove the CTS circuit board 217. (Refer to section 6)
- (3) Remove the various connectors from the logic circuit board 202.
- (4) Unscrew the 2 screws (3x8 CBTS P tight) 301 holding the logic circuit board.
- (5) Unscrew the screw (3x10 CBTS P tight) 302 holding the P.W.B support 241.
- (6) Pull the logic circuit board 202 forward until the DIN jack 240 is disconnected from the rear of the chassis 201; it can then be removed.

#### **9. How to Remove the Power Supply Circuit Board**

- (1) Remove the top cover 240. (Refer to section 1)
- (2) Unscrew the 1 screw (3x8 CBTS P tight) 301 holding the bracket 216 of the power supply circuit board 215.
- (3) By pulling the power switch lever 230 out of the power supply switch, the power supply circuit board can be removed upwards.



## ADJUSTING AND CHECKING THE MECHANISM SECTION

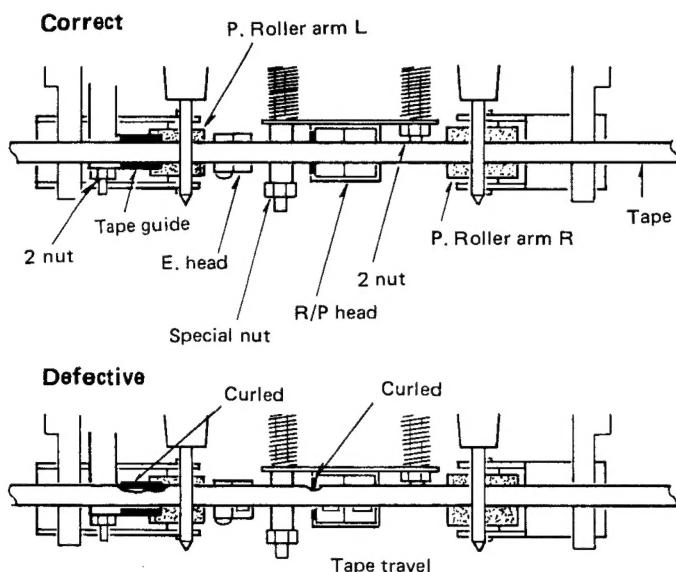
### 1. Replacing the Pinch Roller 23 and 104

Before replacing the pinch roller, clean the tape contact surface of the pinch roller and the capstan shaft.

Most causes of poor tape transport can be traced to dirty pinch rollers and capstan shafts.

The right side pinch roller 23 can be taken out by removing spring 24 and slit washer 317. In the same manner, the left side pinch roller 104 can be taken out by removing spring 106 and slit washer 317. After replacing, play a padless C-90 tape and check for tape curls at the head tape guide section.

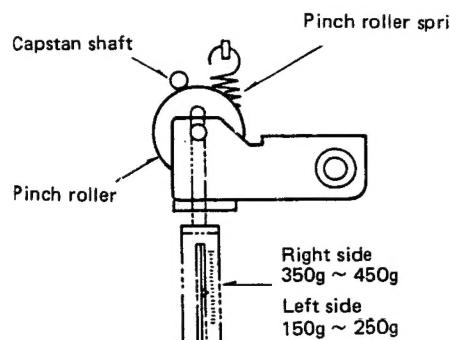
In addition, in the playback mode, check to make sure that the right side pinch roller contacts the capstan shaft before the left side pinch roller contacting.



### 2. Checking the Pressure Force of the Pinch Roller

In the playback mode, hook a spring weight onto the bracket at the center of the pinch roller. After separating the pinch roller from the capstan shaft, allow the pinch roller to contact the capstan shaft again. When the pinch roller starts to rotate, check to make sure the rod type spring weight reading is 350g~450g for the right side and 150g~250g for the left side.

If it is not within the normal range, replace the pinch roller spring 24 or 106.

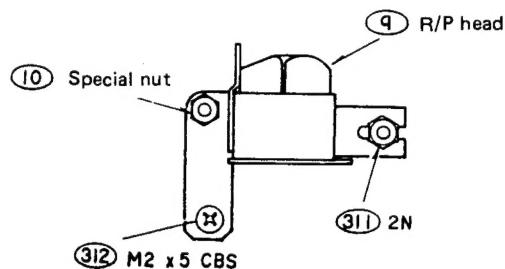


### 3. Replacing the Record/Playback Head

\* Before replacing, remove the front panel 202.

(1) How to remove the R/P HEAD.

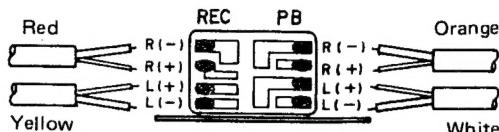
- 1) Next, Take out the azimuth adjustment NUT 311, tilt adjustment screw 312, and the height adjustment ORDER SCREW 10 loosening them alternately. If they are not loosened alternately, the R/P HEAD base may become warped.
- 2) By unsoldering the HEAD WIRES on the circuit board section of the R/P HEAD, the entire R/P HEAD can be taken off the mechanism unit.



(2) How to assemble the R/P HEAD.

Reverse the above (1) procedures for removing the R/P HEAD.

\* Solder the HEAD WIRES according to the diagram above.



### 4. Adjusting the R/P HEAD

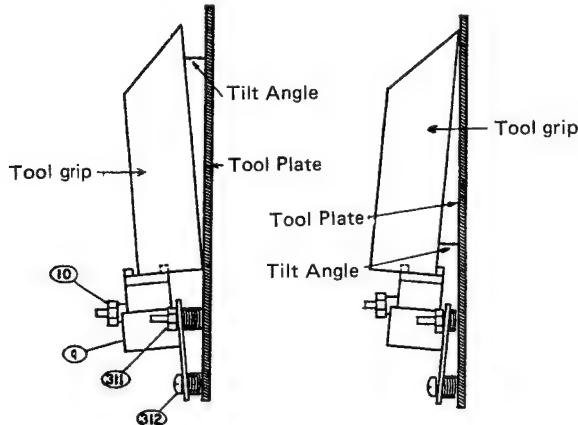
(1) Height adjustments (Use the head adjusting jig M-300)

- 1) Set the M-300 tool plate on the mechanism unit; turn the height adjustment ORDER SCREW 10 and adjust so that the 3.8 mm measure section of the M-300 (tool grip) can pass without contacting the tape guide of the R/P HEAD 9.
- 2) When adjusting the height, make sure the R/P HEAD is not tilted by turning the azimuth adjustment nut 311 nut, and checking with your eyes.

\* Never allow the M-300 (tool grip) to hit the tape contact surface of the R/P HEAD strongly. It may scratch the surface.

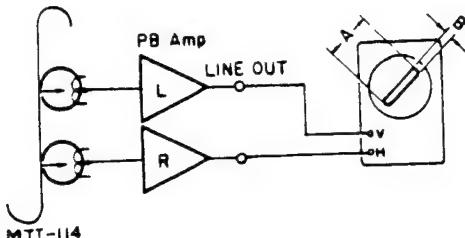
## (2) Adjusting Tilt Angle

- 1) Set the M-300 Tool Plate on the Mechanism Unit and then place the M-300 Tool Grip on the R/P Head, and check the Tilt Angle between M-300 Tool Plate and M-300 Tool Grip. If the M-300 Tool Grip is tilting toward the front, loosen Tilt with screw (312). If the M-300 (Tool Grip) is tilting toward the rear, tighten it. Adjust the Tilt screw (312) until the M-300 Tool Grip becomes parallel with the M-300 Tool Plate.
- 2) If the Tilt Angle is adjusted more than once, height Adjustment may slip. Always make sure to check height adjustment. If height has slipped, adjust it again. After adjustment, fix screw.

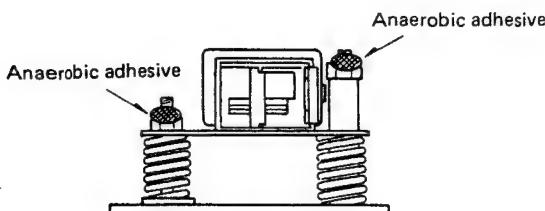


## (3) Azimuth adjustments

Play back the TEAC MTT-114 test tape. Turn the azimuth adjustment nut and adjust so that A of the resurge wave form is maximum and B is minimum. After the azimuth adjustments, re-check the head height with the M-300 to make sure the height has not deviated.



\* After the adjustments, apply anaerobic adhesive on the positions indicated in the diagram.



## 5. Adjustment and Replacement of Erasing Head (15)

### (1) Height Adjustments

Set the M-300 Tool Plate on the mechanism unit. Using a surface measure of 3.8 mm from the M-300 Tool Grip, turn screws (312) and (333) and adjust the height of Erasing Head's center to coincide with the center of the M-300 Tool Grip. After adjustment, place the M-300 Tool Grip on the Erasing Head, check to see that the M-300 Tool Plate and the M-300 Tool Grip are parallel, and that the Tilt Angle has not changed. Lock after adjustment.

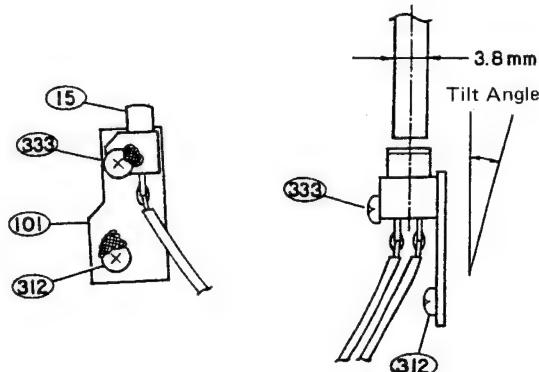
### (2) Tilt Angle Adjustment

Set the M-300 Tool Plate on the mechanism unit. Place the M-300 Tool Grip on the Erasing Head, and check the gap between the M-300 Tool Plate and the Tool Grip. If the M-300 Tool Grip is tilting toward the front, loosen the Tilt screw (312). If it is tilting toward the rear, tighten it and adjust the Tilt screw (312) until the M-300 Tool Grip becomes parallel with the M-300 Tool Plate.

**CAUTION:** After adjusting the Tilt Angle, height adjustment may sometimes be warped. Recheck height adjustment. If it is warped, readjust the height. After adjusting, fix screws (312) and (333).

### (3) Erasing Head Replacement

Erase Head may be replaced after removing screws (312) and (333) which affix it to the deck mechanism. After replacement, adjust the height and the Tilt angle.

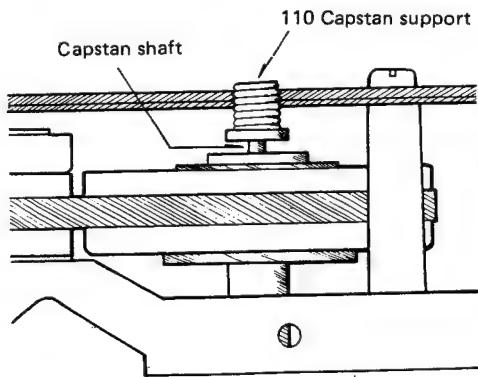


## 6. Height Adjustment of the Tape Guide 103

Set the M-300 jig plate onto the mechanism unit and adjust the height by rotating the height adjustment nut 311 so that the 3.8mm section of the M-300 jig can pass through without contacting the tape guide section of tape guide 103.

## 7. Thrust Play Check and Adjustments of the Capstan Shaft

Thrust Play check and Adjustments of the Capstan Shaft 45, 111. From the front of the mechanism, grasp the capstan shaft and move back and forth in the axis direction. Check to make sure there are thrust play in the right side capstan shaft 45. Rotate and adjust capstan support 110 so that the range of the thrust play of the left side capstan shaft 111 is within 0.2mm–0.4mm. After adjusting, apply anaerobic adhesive to the capstan support 110.



## 8. Checking the Take-up Torque

Load the cassette type torque meter. Check to make sure that the torque meter average reading is within 50 ~ 100 g-cm during playback. If it is not within this range, check the voltage ( $3.5V \pm 0.3V$ ) of the reel motor. If the voltage is low, the torque will be weak; if it is high, the torque will be strong. In addition, check for reel thrust movement in section 9.

## 9. Adjusting the Reel Thrust Movement

Check to make sure that the reel thrust movement is within 0.2–0.4 mm.

## 10. Checking the FF and REW Torques

\* When using the cassette type torque meter.

Check to make sure the torque meter indicates more than 70 g-cm at the end of FF and REW.

\* When using a modified cassette half.

Load the modified cassette half; hook the end of the dial tension meter (full scale 100–300 g) onto the triangle section. In the FF (REW) mode, feed the tape in at a rate somewhat slower than the take up speed. Check to make sure the dial tension meter reads more than 60 g-cm.

## 11. Checking the Back Tension Torque During Record/Playback

Load the cassette type torque meter; check to make sure the torque meter reads between 7 ~ 13 g-cm during playback and that there is no unevenness.

If it is not within this range, check the section on adjusting the reel thrust movement; or replace the spring 109.

## 12. Checking the FF and REW Times

Load a C-60 cassette tape; check to make sure the tape is fast forwarded or rewound within 70–110 seconds. If it is not within this range, check sections 9 and 11.

## 13 Checking the Operation of the Erase Prevention, Metal and Chrome Switch Operation Arms

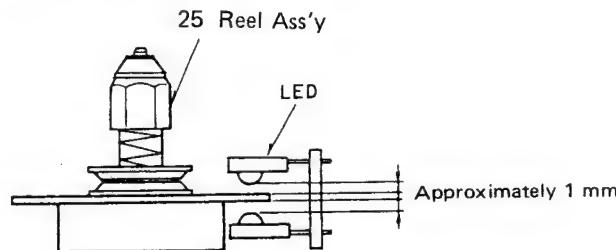
Check to make sure the operation arms 58, 59 operate the switches positively, depending on whether or not there are holes.

## 14. Checking the EJECT Switch 75

To check the operation of the EJECT SW with only the mechanism unit, make sure the angle 205 operates the switch positively when the hook lever 203 is operated.

## 15. Checking the Gap Between the Pulse Detection LED and the Reel Ass'y

Check to make sure the gap between the surface of the shutter section of the reel ass'y and the LEDs is approximately 1 mm.



## ADJUSTING THE ELECTRICAL SECTIONS

### ● Measuring instruments necessary for adjustments

- (1) Audio signal generator
- (2) Variable resistance attenuator
- (3) Vacuum tube voltmeter
- (4) Oscilloscope
- (5) Frequency counter
- (6) Adjustment screwdriver
- (7) Trap coil adjustment square stick
- (8) Test tapes (TEAC MTT-111, MTT-114, MTT-150 )  
(A-BEX TCC-262)  
(DENON DX 3, DXM, DX7/50N, LX)
- (9) Transport Check cassette tape  
(COLUMBIA C-120, modified)

### ● Cautions on adjusting

- (1) Before adjusting, clean the head surface, capstan and the pinch roller with a gauze or a cotton swab moistened with alcohol.
- (2) Demagnetize the R/P HEAD and the E. HEAD with a head eraser.
- (3) Completely demagnetize the adjustment screwdriver.
- (4) Unless instructed otherwise, set the various controls as follows:
  - INPUT volume ..... maximum
  - OUTPUT LEVEL volume ..... maximum
  - DOLBY NR switch ..... OFF
  - MONITOR switch ..... TAPE

## 1. Tape Transport Check

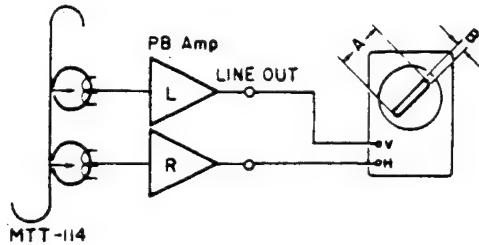
Load the transport check cassette. In the operational mode, illuminate the fixing guides of the R/P HEAD with a lamp and check to make sure the tape edge does not come in contact with the tape guide section.

The tape transport is the most important element in determining the performance of a cassette deck.

Avoid moving the various adjustment screws, nuts, etc., as much as possible. Refer to the pages on "Adjusting and Checking the Mechanism Section" when replacing or adjusting the R/P HEAD.

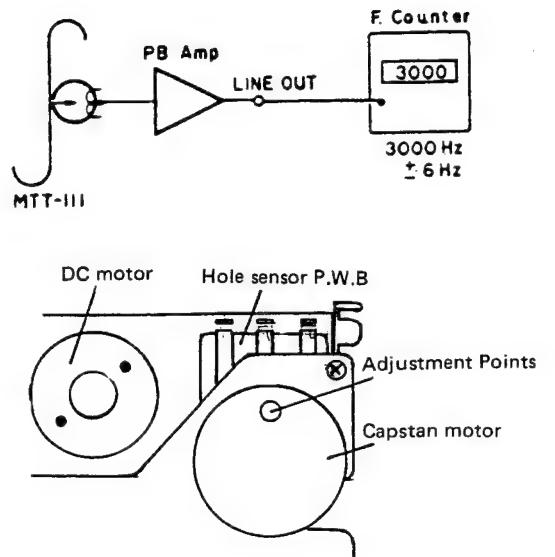
## 2. Adjusting the Azimuth

- (1) After completing the tape transport check load the test tape (TEAC MTT-114).
- (2) Play back the test tape; adjust the azimuth screw so that section A of the resurge wave form is maximum and section B is minimum.



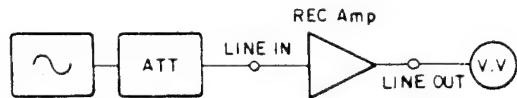
## 3. Checking and Adjusting the Tape Speed

- 1) Connect the frequency counter to the LINE OUT terminal and load the test tape (TEAC MTT-111). DR-M44
- 2) Play back the test tape; at the midpoint of the tape, where the transport is stable, adjust VR 901 so that the frequency counter reading is in the range of 3,000 Hz  $\pm$  6Hz. DR-M33
- 3) Playback a test tape. At about halfway through the tape, where the tape transport is stable, adjust the adjustment points on the back of the capstan motor so that the frequency counter will have a reading within the range of 3,000 Hz  $\pm$  6Hz.



## 4. Adjusting the Input Sensitivity

- (1) Set the MONITOR switch to SOURCE position, the operational mode at STOP. Supply a 400 Hz signal to the LINE IN terminal and set the input signal level (approx. -20 dB) so that the output level at the LINE OUT TERMINAL (L ch) becomes 0dB.
- (2) At the same time, check to make sure the R ch output level is also 0dB.

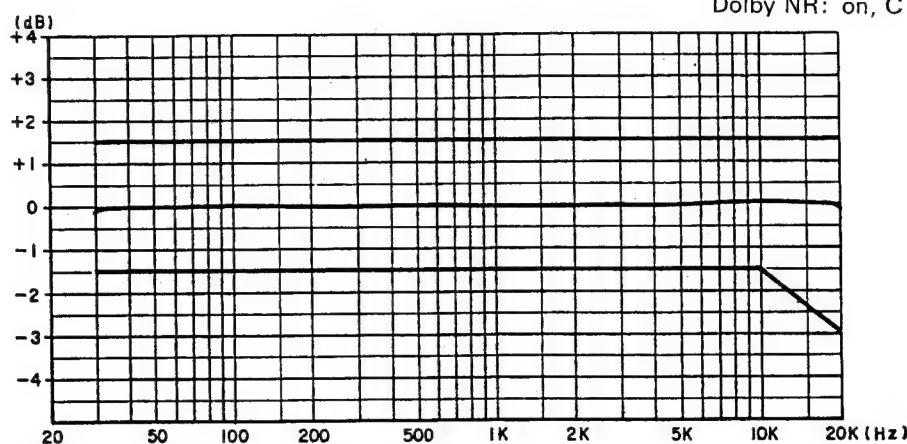


## 5. Checking the Operation of the DOLBY

Set the MONITOR switch to SOURCE. When a -41dB signal input is made to the LINE IN terminal, check to make sure the output frequency response from the LINE OUT terminal meets the specification in the diagram below.

Dolby C Back to Back Frequency Response

Level: -20dB from Dolby  
Monitor: Source  
Dolby NR: on, C



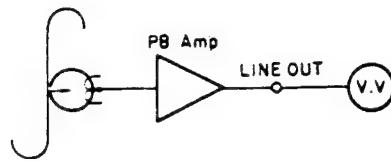
## 6. Adjusting the Playback Section

### (1) Adjusting the playback level

Play back the Dolby standard level test tape (TEAC MTT-150) and adjust RT 101 (L ch), RT 201 (R ch) so that the LINE OUT voltage becomes 0 dB (0.775V).

### (2) Adjusting the playback frequency response

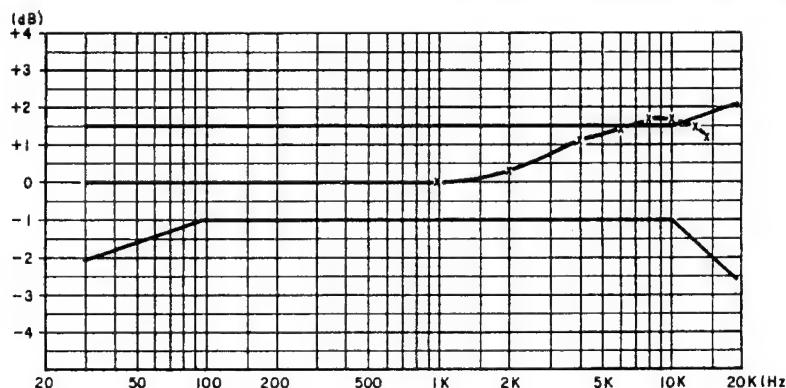
Play back the test tape (A-BEX TCC-262) and check to make sure that the frequency response meets the specifications in the diagram.



## Playback Frequency Response

Tape : A-BEX TCC-262

When using MTT-316 make corrections along.



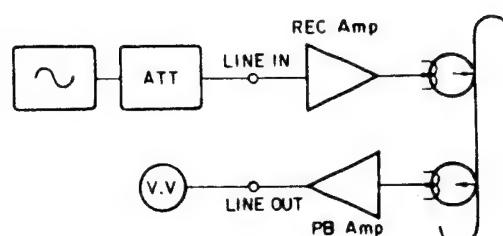
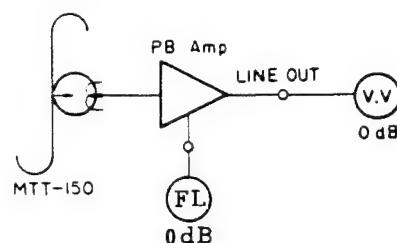
## 7. Adjusting the FL Meter

After adjusting the playback level, playback the test tape (TEAC MTT-150) and adjust RT401 (L ch), RT402 (R ch) so that the FL meter indicates 0dB when the LINE OUT terminal level is 0dB (0.775V).

## 8. Adjusting the Recording Section

### (1) Adjusting the record/playback overall frequency response.

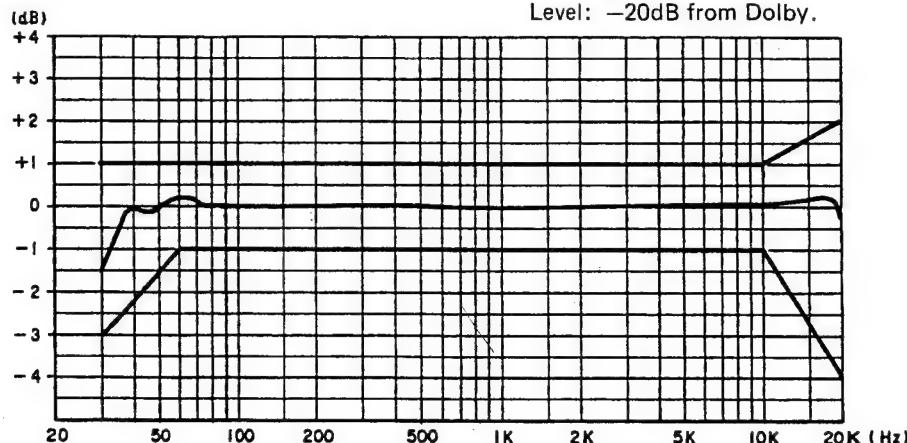
- 1) Load the test tape DX7/50N; record a signal with an input level of -41 dB, 1 kHz at the LINE IN terminal; play back this recording.
- 2) Change the frequency of the input signal to 12kHz, record and playback; adjust RT105 (L ch), RT205 (R ch) so that the characteristic standards meet the following diagram when compared to the 1kHz signal output level.



## Record/Playback Overall Frequency Response

Tape: DN7N Dolby: off

Level: -20dB from Dolby.



(2) Adjusting the record/playback levels

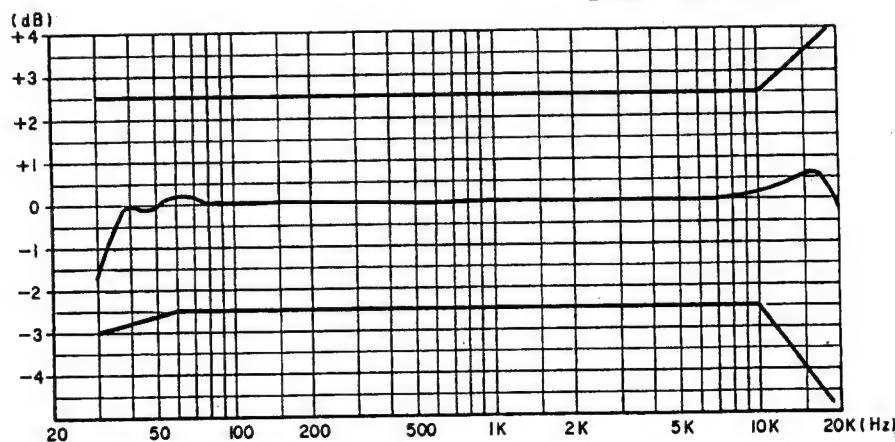
- 1) Load the test tape DX7/50N and record a signal of 1kHz (-41 dB).
- 2) Adjust RT103 (L ch), RT203 (R ch) so that the output level is the same when the MONITOR switch is switched from SOURCE to TAPE position.
- 3) Load the test tape and record a signal of 1kHz (-41 dB).
- 4) Adjust RT 102 (L ch), RT 202 (R ch) so that the output level is the same when the MONITOR switch is switched from SOURCE to TAPE position.
- 5) Load the test tape DX3 and record a signal of 1kHz (-41 dB).
- 6) Adjust RT104 (L ch), RT 204 (R ch) so that the output level is the same when the MONITOR switch is switched from SOURCE to TAPE position.

(3) Checking the Dolby C record/playback overall frequency response

- 1) Set the DOLBY NR switch to the "C" position.
- 2) Using the test tapes DXM, DX7/50N, DX-3, perform record/playback in the same manner as 8-(1).
- 3) Check to make sure that the record/playback overall frequency response meets the specifications in the diagram.

**Dolby C Record/Playback Overall Frequency Response.**

Tape: DX7N  
Dolby: on, C  
Level: -20dB from Dolby



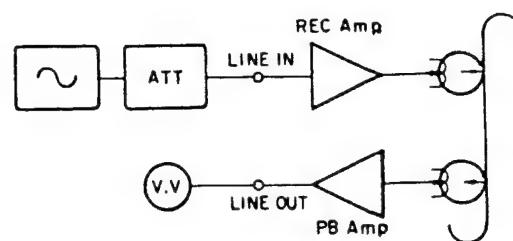
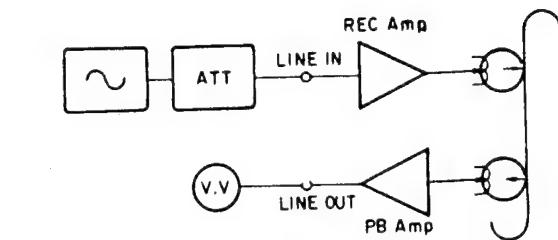
## 9. Adjusting the CTS

(1) Adjusting the CTS Amplifier Gain

Set the switch S701 of the CTS circuit board to the TEST side and press the CTS START button. During its operation, adjust VR 501 (L ch), VR 601 (R ch) so that the levels at TP(L), TP(R) alternates frequently between H → L or L → H.

(2) Checking the CTS Operation

- 1) Load the LX-C60 cassette tape. Light the preset lamp and set to the preset mode. Record/playback 1kHz and 12kHz signals and note the frequency response.
- 2) Press the CTS START button. After it is completed, (CTS lamp lit), record/playback the 1kHz signals and check to make sure the frequency response is improved over those recorded in section 1).



● Beat Interference

Beat interference may result if the unit is used close to an AM tuner. In this case separate the distance between the tuner and the cassette deck.

PARTS LIST OF P.W. BOARD

KU-5200 AUDIO AMP UNIT

| Ref. No.   | Part No.   | Part Name      | Remarks                  |
|--|------------|----------------|--------------------------|
| <b>SEMICONDUCTOR GROUP</b>                                       |            |                |                          |
| IC101,104<br>201,204   | 2630311002 | NE651          |                          |
| IC307,308  | 2620290007 | HD74LS05P      |                          |
| IC301  | 2630226003 | M5220L         |                          |
| IC302~306  | 2630189001 | M5218L         |                          |
| IC309  |            |                |                          |
| IC102,103<br>202,203   |            |                |                          |
| TR302  | 2710113010 | 2SA999 (F)     |                          |
| TR101~107<br>201~207<br>110~115<br>210~215<br>301,302<br>304~308 | 2730204035 | 2SC2320 (E/F)  |                          |
| TR303  | 2730195005 | 2SC2060 (Q)    |                          |
| TR108,109<br>208,209   | 2750043014 | 2SK381 (C/D)   |                          |
| D301~308   | 2760049008 | IS2076         |                          |
| TH101,201  | 2760118007 | D33A           |                          |
| <b>RESISTOR GROUP</b>  |            |                |                          |
| R322   | 2412313082 | RD14B2E4R7JFRF | 4.7Ω 1/4W                |
| R188,288   | 2412339024 | RD14B==244J    | 220KΩ                    |
| VR303  | 2118077004 | V1220V30KB501  | DR-M33 only              |
| VR301  | 2118076005 | V1620V--103KA  | 10KΩA                    |
| VR302  | 2118075006 | V1611V--503KA  | 50KΩA                    |
| RT104,204  | 2116000015 | V08PB103       | 10KΩB                    |
| RT302  | 2116000060 | V08PB501       | 500ΩB                    |
| RT101,201  | 2116000099 | V08PB202       | 2KΩB                     |
| RT102,103<br>202,203   | 2116000073 | V08PB203       | 20KΩB                    |
| RT105,205  | 2116000086 | V08PB204       | 200KΩB                   |
| RT301  | 2116000099 | V08PB202       | 2KΩB                     |
| <b>CAPACITOR GROUP</b>   |            |                |                          |
| C102,202   | 2533635005 | CC45SL1H221J   | Ceramic<br>220PF 50V     |
| C122,222   | 2533633007 | CC45SL1H181J   | 180PF 50V                |
| C121,133   | 2539014002 | CK45=1E683M    | 0.068μF 25V              |
| C221,233   |            |                |                          |
| C101,152<br>201,252  | 2531055056 | CK45B1H221K    | 220PF 50V                |
| C155,255   | 2531003008 | CK45B1H681K    | 680PF 50V                |
| C146,246   | 2531006005 | CK45B1H222K    | 0.0022μF 50V             |
| C148,248   | 2531061008 | CK45B1H272K    | 0.0027μF 50V             |
| C309   | 2531007004 | CK45B1H332K    | 0.0033μF 50V             |
| C318   | 2531062007 | CK45B1H392K    | 0.0039μF 50V             |
| C315~317   | 2531024003 | CK45F1H103Z    | 0.01μF 50V               |
| C153,253   | 2531008003 | CK45B1H472K    | 0.0047μF 50V             |
| C103,203<br>301,302  | 2544129005 | CE04W1A470=    | Electrolytic<br>47μF 10V |
| C313   | 2544131006 | CE04W1A221=    | 220μF 10V                |

| Ref. No.   | Part No.   | Part Name   | Remarks       |
|--|------------|-------------|---------------|
| C106~108<br>116,123<br>124,128<br>136,140<br>141,142<br>206~208<br>216,223<br>224,228<br>236,240<br>241,242<br>303~307<br>157,257<br>C125,150<br>225,250<br>311<br>C109,118<br>130,137<br>209,218<br>230,237<br>C117,129<br>217,229<br>C156,256<br>312 | 2544132005 | CE04W1C100= | 10μF 16V      |
| C154,254   | 2551120039 | CQ93M1H182J | 0.0018μF 50V  |
| C147,247   | 2551120026 | CQ93M1H152J | 0.0015μF 50V  |
| C145,245   | 2551120042 | CQ93M1H222J | 0.0022μF 50V  |
| C144,244   | 2551120068 | CQ93M1H332J | 0.0033μF 50V  |
| C113,114   | 2551120084 | CQ93M1H472J | 0.0047μF 50V  |
| 213,214<br>127,137<br>149,227<br>234,249<br>C104,105<br>204,205  |            |             |               |
| C112,212<br>135,235  | 2551121025 | CQ93M1H103J | 0.01μF 50V    |
| C310   | 2551073005 | CQ93M1H123K | 0.012μF 50V   |
| C115,126   | 2551121083 | CQ93M1H333J | 0.033μF 50V   |
| 215,226<br>C110,119  | 2551078000 | CQ93M1H333K | 0.033μF 50V   |
| 131,138<br>210,219<br>231,238<br>C151,251<br>C120,132  |            |             |               |
| C151,251   | 2551121096 | CQ93M1H393J | 0.039μF 50V   |
| C120,132   | 2551122008 | CQ93M1H473J | 0.047μF 50V   |
| 220,232<br>C308<br>C111,139  |            |             |               |
| C308   | 2554078081 | CQ93P2A562J | 0.0056μF 100V |
| C111,139   | 2561030025 | CF93B2A224J | 0.22μF 100V   |
| 211,239  |            |             |               |

**KU-0451-1 CTS UNIT**

| Ref. No.                 | Part No.   | Part Name         | Remarks    |
|--------------------------|------------|-------------------|------------|
| <b>OTHER PARTS GROUP</b> |            |                   |            |
| L101,201                 | 4148205103 | SHIELD CASE       |            |
|                          | 2310825009 | BIAS FILTER       |            |
| L102,104                 | 2358011008 | INDUCTOR          |            |
| 202,204                  |            |                   |            |
| L103,203                 | 2328043006 | MPX FILTER        |            |
| L105,205                 | 2358005001 | INDUCTOR          |            |
| L106,206                 | 2328044005 | BAND TRAP         |            |
|                          |            | FILTER            |            |
| L301                     | 2358005030 | INDUCTOR          |            |
| T301                     | 2398024000 | OSC COIL          |            |
| S301                     | 2129223009 | PUSH SWITCH       | DOLBY SW   |
| S302                     | 2129224008 | PUSH SWITCH       | MONITOR SW |
| J301                     | 2048114008 | 4P PIN JACK       |            |
| J302                     | 2048109013 | HEADPHONE JACK    |            |
| CN101,201                | 2032075001 | 2P CONNECTOR BASE | PB HEAD    |
| CN301                    | 2035622024 | 4P MINI CONN. PIN | REC HEAD   |
| CN302                    | 2035622008 | 3P MINI CONN. PIN | E HEAD     |
| 303                      |            |                   |            |
| CN304                    | 2035622079 | 7P MINI CONNE PIN |            |
| CN305                    | 2035691042 | 3P EI CON WITH W  |            |
| CN306                    | 2035691039 | 3P EI CON WITH W  |            |
| CN307                    | 2041640003 | 6P EI CON WITH W  |            |

• The carbon resistors rated at 1/4W are not listed herein.

| Ref. No.                   | Part No.   | Part Name         | Remarks      |
|----------------------------|------------|-------------------|--------------|
| <b>SEMICONDUCTOR GROUP</b> |            |                   |              |
| IC701                      | 2620346003 | HD44705A42        |              |
| IC703                      | 2630161003 | $\mu$ PC358C      |              |
| IC501                      | 2630229000 | LA6458DS          |              |
| 601,702                    |            |                   |              |
| 704                        |            |                   |              |
| TR501~511                  | 2730204035 | 2SC2320 (E/F)     |              |
| 601~611                    |            |                   |              |
| 702~712                    |            |                   |              |
| D501,502                   | 2760049008 | IS2076            |              |
| 601,602                    |            |                   |              |
| 701                        |            |                   |              |
| D503,504                   | 2760001004 | IN34A             |              |
| 603,604                    |            |                   |              |
| <b>RESISTOR GROUP</b>      |            |                   |              |
| VR501,601                  | 2116004024 | V08QB202          | 2KΩB         |
| <b>CAPACITOR GROUP</b>     |            |                   |              |
|                            |            |                   | Ceramic      |
| C504,604                   | 2531002009 | CK45B1H471K       | 470PF 50V    |
| C505,605                   | 2531004007 | CK45B1H102K       | 0.001μF 50V  |
| C701,702                   | 2531153000 | CK99B1H102MP4     | 0.001μF 50V  |
|                            |            |                   | Electrolytic |
| C704                       | 2544130007 | CE04W1A101=       | 100μF 10V    |
| C507,508                   | 2544132005 | CE04W1C100=       | 10μF 16V     |
| 512,607                    |            |                   |              |
| 608,612                    |            |                   |              |
| C701,703                   | 2544134003 | CE04W1C330=       | 33μF 16V     |
| C506,509                   | 2544140000 | CE04W1V4R7=       | 4.7μF 35V    |
| 606,609                    |            |                   |              |
| 613,513                    |            |                   |              |
|                            |            |                   | Film         |
| C503,603                   | 2551060005 | CQ93M1H102K       | 0.001μF 50V  |
| C610,611                   | 2551062003 | CQ93M1H152K       | 0.0015μF 50V |
| C502,602                   | 2551063002 | CQ93M1H182K       | 0.0018μF 50V |
| C501,601                   | 2551066009 | CQ93M1H332K       | 0.0033μF 50V |
| C510,511                   | 2551074004 | CQ93M1H153K       | 0.015μF 50V  |
| C702                       | 2551079009 | CQ93M1H393K       | 0.039μF 50V  |
| <b>OTHER PARTS GROUP</b>   |            |                   |              |
| CN701,704                  | 2035622024 | 4P MINI CONN. PIN |              |
| CN702,703                  | 2050171000 | 12P BASE CONTACT  |              |
| L501,601                   | 2310825009 | BIAS FILTER       |              |
| S701                       | 2129190103 | SLIDE SW          |              |

• The carbon resistors rated at 1/4W are not listed herein.

# KU-5210 POWER AND LOGIC UNIT

| Ref. No.                    | Part No.   | Part Name      | Remarks              |  |
|-----------------------------|------------|----------------|----------------------|--|
| <b>SEMICONDUCTOR GROUP</b>  |            |                |                      |  |
| IC1,2                       | 2620294003 | HD74LS32P      |                      |  |
| IC3                         | 2620443003 | HD74LS15P      |                      |  |
| IC4                         | 2620427003 | HD74LS138P     |                      |  |
| IC5                         | 2620408006 | UPD1511C-097   |                      |  |
| IC6,7                       | 2620447009 | BA6109U1       |                      |  |
| TR6,15                      | 2710113010 | 2SA999 (F)     |                      |  |
| 17~19,22                    |            |                |                      |  |
| TR2,12                      | 2710105002 | 2SA966 (Y)     |                      |  |
| TR7,11                      | 2720055029 | 2SB772 Q/P     |                      |  |
| TR5,8,9                     | 2730204035 | 2SC2320 (E/F)  |                      |  |
| 13,14,16,<br>20,21<br>23~26 |            |                |                      |  |
| TR1                         | 2730195005 | 2SC2060 (Q)    |                      |  |
| TR3,4,10                    | 2740078031 | 2SD882 (Q/P)   |                      |  |
| D1                          | 2760246005 | RB152          |                      |  |
| D2,7                        | 2760057003 | V06B           |                      |  |
| D3~6                        | 2760237001 | RV06           |                      |  |
| D8~12                       | 2760049008 | IS2076         |                      |  |
| ZD1                         | 2760249002 | HZ18-2         |                      |  |
| ZD2,5                       | 2760303003 | HZ6C-2         |                      |  |
| ZD3,4                       | 2760052053 | HZ11B-1        |                      |  |
| ZD6                         | 2760220018 | HZ24-1         |                      |  |
| ZD7,11,14                   | 2760299052 | HZ3B-3         |                      |  |
| ZD8                         | 2760185027 | HZ4B-2         |                      |  |
| ZD9                         | 2760185056 | HZ4C-2         |                      |  |
| ZD10                        | 2760236073 | HZ5B-1         |                      |  |
| ZD12                        | 2760051083 | HZ7C-3         |                      |  |
| ZD13                        | 2760218046 | HZ9B-1         |                      |  |
| <b>RESISTOR GROUP</b>       |            |                |                      |  |
| R2                          | 2442028017 | RD14B2E330JFRF | 33Ω 1/4W             |  |
| R48                         | 2440079026 | RS14B3D270JNBF | 27Ω 2W               |  |
| R17                         | 2410163001 | RD14B2H121J    | 120Ω 2W              |  |
| RB1                         | 2462018007 | RK99=2B103MP6  | 10KΩx6 1/8W          |  |
| RB2                         | 2462011088 | RK99=2B153MP3  | 15KΩx3 1/8W          |  |
| RB3                         | 2462010076 | RK99=2B103MP4  | 10KΩx4 1/8W          |  |
| RB4                         | 2462010092 | RK99=2B104MP4  | 100KΩx41/8W          |  |
| <b>CAPACITOR GROUP</b>      |            |                |                      |  |
| C30                         | 2533627000 | CC45SL1H101J   | Ceramic<br>100PF 50V |  |
| C29                         | 2533635005 | CC45SL1H221J   | 220PF 50V            |  |
| C36,38                      | 2531024003 | CK45F1H103Z    | 0.01μF 50V           |  |
| C31~34                      | 2531004007 | CK45B1H102K    | 0.001μF 50V          |  |
| C21~26                      | 2531024003 | CK45F1H103Z    | 0.01μF 50V           |  |
| 15,40,45                    |            |                |                      |  |
| C37,39                      | 2531025002 | CK45F1H223Z    | 0.022μF 50V          |  |
| C27                         | 2539014002 | CK45=1E683M    | 0.068μF 25V          |  |
| C44                         | 2539012004 | CK45=1E333M    | 0.033μF 25V          |  |
| C99                         | 2539015001 | CK45=1E104M    | 0.1μF 25V            |  |
| C90                         | 2539014002 | CK45=1E683M    | 0.068μF 25V          |  |
| C42                         | 2538010007 | CK45=2GAC103P  | 0.01μ 400V           |  |

| Ref. No.                 | Part No.   | Part Name        | Remarks     |              |
|--------------------------|------------|------------------|-------------|--------------|
| C3,4                     | 2544128006 | CE04W1A220=      | 22μF 10V    | Electrolytic |
| C6,9,10,12               | 2544129005 | CE04W1A470=      | 47μF 10V    |              |
| C7,13,<br>20,35          | 2544130007 | CE04W1A101=      | 100μF 10V   |              |
| C5,8,11                  | 2544163032 | CE04W1C102M      | 1000μF 16V  |              |
| C17~19                   | 2544138009 | CE04W1E470=      | 47μF 25V    |              |
| C2                       | 2546071009 | CE04W1E103=      | 10000μF 25V |              |
| C10,14,28                | 2544140000 | CE04W1V4R7=      | 4.7μF 35V   |              |
| C16                      | 2544165014 | CE04W1V471M      | 470μF 35V   |              |
| C43                      | 2544147003 | CE04W1H2R2=      | 2.2μF 50V   |              |
| <b>OTHER PARTS GROUP</b> |            |                  |             |              |
|                          | 4170140207 | RADIATOR         |             |              |
|                          | 3998031007 | CERAMIC          |             |              |
|                          | 2048110002 | RESONATOR        |             |              |
| CN2,3                    | 2032075001 | 8P DIN JACK      |             |              |
| CN1,10,11                | 2035622066 | 2P CONNE. BASE   |             |              |
| CN4                      | 2035622037 | 5P MINI CONN.    |             |              |
| CN5                      | 2031637037 | PIN              |             |              |
| CN8                      | 2045408018 | 8P MINI CONN.    |             |              |
| CN7                      | 2041639014 | PIN              |             |              |
| CN12                     | 2041639001 | 4P EI CON        |             |              |
| CN1                      | 2039632023 | 7P EI CON        |             |              |
| CN6                      | 2050170001 | 6P EI CON        |             |              |
| CN9,13                   | 2035622024 | 5P EI CON        |             |              |
| LF1                      | 2129188005 | 12P BOARD BASE   |             |              |
|                          | 2129136028 | 4P MINI CON PIN  |             |              |
|                          | 2398019002 | SLIDE SWITCH     |             |              |
|                          | FEP1287    | POWER SW         |             |              |
|                          | 4118343202 | LINE FILTER COIL |             | Except EU    |
|                          | 2061031032 | FUSE HOLDER      |             |              |
|                          | 2061031045 | POWER SW         |             |              |
|                          |            | BRACKET          |             |              |
|                          |            | FUSE 0.16A       |             | Except EU    |
|                          |            | FUSE 0.25A       |             | E1 only      |

• The carbon resistors rated at 1/4W are not listed herein.

## WARNING:

Parts marked with and/or shading have special characteristics important to safety. Be sure to use the specified parts for replacement.

# KU-5220/KU-5221 CONTROL UNIT

| Ref. No. | Part No.   | Part Name        | Remarks |
|----------|------------|------------------|---------|
| C541~460 | 2124388004 | TACT SWITCH      |         |
| CN451    | 2045413003 | 8P EI CON WITH W |         |
| CN452    | 2041630026 | 5P EI CON WITH W |         |
| CN453    | 2037643108 | 4P EI CON ASSY   |         |

**KU-5230 COUNTER/METER UNIT**

| Ref. No.                   | Part No.   | Part Name            | Remarks                     |
|----------------------------|------------|----------------------|-----------------------------|
| <b>SEMICONDUCTOR GROUP</b> |            |                      |                             |
| IC401                      | 2620439004 | UPD554C-121          |                             |
| IC402,403                  | 2620523004 | BA668                |                             |
| TR412,415                  | 2710113010 | 2SA999 (F)           |                             |
| 416,418                    |            |                      |                             |
| TR405~409                  | 2730204035 | 2SC2320 (E/F)        |                             |
| 413,414                    |            |                      |                             |
| 417                        |            |                      |                             |
| TR410,411                  | 2750043014 | 2SK381 (C/D)         |                             |
| D401~407                   | 2760049008 | IS2076               |                             |
| ZD401                      | 2760236060 | HZ5C2                |                             |
| <b>RESISTOR GROUP</b>      |            |                      |                             |
| RT401,402                  | 2116000044 | V08PB503             | 50KΩB                       |
| RB404                      | 2462011091 | RK99=2B473MP3        | 47KΩx3 1/8W                 |
| RB406                      | 2462011046 | RK99=2B472MP3        | 4.7KΩx3 1/8W                |
| RB401                      | 2462010092 | RK99=2B104MP4        | 100KΩx41/8W                 |
| RB402                      | 2462012032 | RK99=2B104MP8        | 100KΩx81/8W                 |
| RB405                      | 2462018010 | RK99=2B473MP6        | 47KΩx6 1/8W                 |
| <b>CAPACITOR GROUP</b>     |            |                      |                             |
| C418                       | 2533627000 | CC45SL1H101J         | Ceramic<br>100PF 50V        |
| C402                       | 2531060009 | CK45B1H182K          | 0.0018μF 50V                |
| C404                       | 2531008003 | CK45B1H472K          | 0.0047μF 50V                |
| C417                       | 2539011005 | CK45=1E223M          | 0.022μF 25V<br>Electrolytic |
| C405~407                   | 2544132005 | CE04W1C100=          | 10μF 16V                    |
| 410~413                    |            |                      |                             |
| C414                       | 2544146004 | CE04W1H010=          | 1μF 50V                     |
| C401,408                   | 2544147003 | CE04W1H2R2=          | 2.2μF 50V                   |
| 409,413                    |            |                      |                             |
| C403                       | 2544148002 | CE04W1H3R3=          | 3.3μF 50V                   |
| <b>OTHER PARTS GROUP</b>   |            |                      |                             |
| CN401                      | 2035622082 | 6P CONN BASE         |                             |
| 402,406                    |            |                      |                             |
| CN404                      | 2035622066 | 5P MINI CONN.<br>PIN |                             |
| CN405,407                  | 2035622008 | 3P MINI CONN.<br>PIN |                             |
| CN408                      | 2035622024 | 4P MINI CONN.<br>PIN |                             |
|                            | 2358014034 | INDUCTOR             |                             |
|                            | 3934013005 | FL METER             |                             |
|                            | 4428141000 | METER HOLDER         |                             |

**KU-5231 COUNTER/METER UNIT**

| Ref. No.                   | Part No.   | Part Name            | Remarks                     |
|----------------------------|------------|----------------------|-----------------------------|
| <b>SEMICONDUCTOR GROUP</b> |            |                      |                             |
| IC401                      | 2620439004 | UPD554C-121          |                             |
| IC402,403                  | 2620523004 | BA668                |                             |
| TR401~404                  | 2710113010 | 2SA999 (F)           |                             |
| 412,415                    |            |                      |                             |
| 416,418                    |            |                      |                             |
| TR405~409                  | 2730204035 | 2SC2320 (E/F)        |                             |
| 413,414                    |            |                      |                             |
| 417                        |            |                      |                             |
| TR410,411                  | 2750043014 | 2SK381 (C/D)         |                             |
| D401~407                   | 2760049008 | IS2076               |                             |
| ZD401                      | 2760236060 | HZ5C2                |                             |
| <b>RESISTOR GROUP</b>      |            |                      |                             |
| RT401,402                  | 2116000044 | V08PB503             | 50KΩB                       |
| RT471                      | 2412334003 | RD14B==152J          | 1.5KΩ                       |
| RB404                      | 2462011091 | RK99=2B473MP3        | 47KΩx3 1/8W                 |
| RB406                      | 2462011046 | RK99=2B472MP3        | 4.7KΩx3 1/8W                |
| RB401                      | 2462010092 | RK99=2B104MP4        | 100KΩx41/8W                 |
| RB402                      | 2462012032 | RK99=2B104MP8        | 100KΩx81/8W                 |
| RB405                      | 2462018010 | RK99=2B473MP6        | 47KΩx6 1/8W                 |
| <b>CAPACITOR GROUP</b>     |            |                      |                             |
| C418                       | 2533627000 | CC45SL1H101J         | Ceramic<br>100PF 50V        |
| C402                       | 2531060009 | CK45B1H182K          | 0.0018μF 50V                |
| C404                       | 2531008003 | CK45B1H472K          | 0.0047μF 50V                |
| C417                       | 2539011005 | CK45=1E223M          | 0.022μF 25V<br>Electrolytic |
| C405~407                   | 2544132005 | CE04W1C100=          | 10μF 16V                    |
| 410~413                    |            |                      |                             |
| C414                       | 2544146004 | CE04W1H010=          | 1μF 50V                     |
| C401,408                   | 2544147003 | CE04W1H2R2=          | 2.2μF 50V                   |
| 409,413                    |            |                      |                             |
| C403                       | 2544148002 | CE04W1H3R3=          | 3.3μF 50V                   |
| <b>OTHER PARTS GROUP</b>   |            |                      |                             |
| CN401                      | 2035622082 | 6P CONN BASE         |                             |
| 402,406                    |            |                      |                             |
| CN403                      | 2031639040 | 4P EI CON            |                             |
| CN404                      | 2035622066 | 5P MINI CONN.<br>PIN |                             |
| CN405,407                  | 2035622008 | 3P MINI CONN.<br>PIN |                             |
| CN408                      | 2035622024 | 4P MINI CONN.<br>PIN |                             |
|                            | 2358014034 | INDUCTOR             |                             |
|                            | 3934013005 | FL METER             |                             |
|                            | 4428141000 | METER HOLDER         |                             |

• The carbon resistors rated at 1/4W are not listed herein.

• The carbon resistors rated at 1/8W are not listed herein.

# PARTS LIST OF EXPLODED VIEW (DR-M33)

| Ref. No. | Part No.   | Part Name          | Remarks                |
|----------|------------|--------------------|------------------------|
| 201      | 4118341602 | CHASSIS            | BK, E1 only<br>E1 only |
|          | 4118341615 | CHASSIS            |                        |
|          | 4118341518 | CHASSIS            |                        |
| 202      | KU-5210    | PWR LOGIC UNIT     |                        |
| 203      | KU-5200    | AUDIO PWB UNIT     |                        |
| 204      | KU-5220    | CONTROL UNIT       |                        |
| 205      | KU-5230    | COUNTER/METER UNIT |                        |
| 206      | 1038244303 | FRONT CHASSIS      |                        |
| 207      | 3388015002 | V. MECHA 81        |                        |
| 208      | 4118347101 | EARTH PLATE (A)    |                        |
| 209      | 4148198003 | SHIELD BRACKET     |                        |
| 210      | 4118346115 | ANGLE              |                        |
| 211      | 2339082001 | POWER TRANS        | E1 only<br>EU only     |
|          | 2339084009 | POWER TRANS        |                        |
|          | 2339083107 | POWER TRANS        |                        |
| 212      | 4118342410 | TRANS BRACKET      | E1, EU only            |
|          | 4118342407 | TRANS BRACKET      |                        |
| 213      | 2062002031 | AC CORD            | E2                     |
|          | 2006031026 | AC CORD            | E1                     |
|          | 2006019310 | AC CORD            | EA                     |
|          | 2062024006 | AC CORD WITH LABEL | EK                     |
|          | 2062019008 | AC CORD            | EU                     |
| 214      | 4450018004 | CORD BUSH          | E1, EU only<br>EA only |
|          | MD-3802    | CORD BUSH          |                        |
|          | MD-2982H   | CORD BUSH          |                        |
| 215      | KU-52102   | POWER SW PWB       |                        |
| 216      | 4118343202 | POWER SW BRACKET   |                        |
| 218      | 1058089108 | BOTTOM COVER       |                        |
| 219      | 4610162004 | FELT PAD           |                        |
| 220      | 1438041009 | METER WINDOW       |                        |
| 221      | 1038246026 | FRONT ESC          | BK                     |
|          | 1038246042 | FRONT ESC          |                        |
| 222      | 1138174108 | PUSH KNOB (A)      | BK                     |
|          | 1138174111 | PUSH KNOB (A)      |                        |
| 223      | 1138175204 | CONTROL BUTTON     | BK                     |
|          | 1138175217 | CONTROL BUTTON     |                        |
| 224      | 4118421001 | PRESS BAR          |                        |
| 225      | 1138179006 | PUSH BUTTON (A)    | BK                     |
|          | 1138179019 | BUSH BUTTON (A)    |                        |
| 226      | 1138180008 | BUTTON SHAFT       |                        |
| 227      | 4638623004 | SPRING             |                        |
| 228      | 1138181007 | PUSH BUTTON (B)    | BK                     |
|          | 1138181018 | PUSH BUTTON (B)    |                        |
| 229      | 4318098108 | PUSH SW LEVER      |                        |
| 230      | 4318101008 | P.S. LEVER ASS'Y   | BK                     |
|          | 4318101011 | P.S. LEVER ASSY    |                        |
| 231      | 4318102007 | EJECT KNOB ASS'Y   | BK                     |
|          | 4318102010 | EJECT KNOB ASS'Y   |                        |
| 232      | 4318104102 | EJECT PLATE        |                        |
| 233      | 1038247122 | FRONT PANEL ASS'Y  | BK                     |
|          | 1038247148 | FRONT PANEL ASS'Y  |                        |
| 234      | KU-52101   | TIMER SW PWB       |                        |
| 235      | 1138155130 | SLIDE KNOB (B)     | BK                     |
|          | 1138155143 | SLIDE KNOB (B)     |                        |

| Ref. No. | Part No.   | Part Name        | Remarks |
|----------|------------|------------------|---------|
| 236      | 1128112109 | VOL. KNOB (A)    | BK      |
|          | 1128112112 | VOL. KNOB (A)    |         |
| 237      | 1128113108 | VOL. KNOB (B)    | BK      |
|          | 1128113111 | VOL. KNOB (B)    |         |
| 238      | 1128114000 | VOL. KNOB (C)    | BK      |
|          | 1128114013 | VOL. KNOB (C)    |         |
| 239      | 1038253103 | C. WINDOW ASS'Y  | BK      |
|          | 1038253129 | C. WINDOW ASS'Y  |         |
| 240      | 1028319251 | TOP COVER        | BK      |
|          | 1028319248 | TOP COVER        |         |
| 241      | 4428055002 | P.W.B. SUPPORT   |         |
| 242      | 4428141000 | METER HOLDER     |         |
| 243      | 4118420109 | SHIELD SHEET     |         |
| 244      | 4128747102 | SHIELD BRACKET   |         |
| 246      | 1038249104 | SIDE FRAME (L)   | BK      |
|          | 1038249117 | SIDE FRAME (L)   |         |
| 247      | 1038250106 | SIDE FRAME (R)   | BK      |
|          | 1038250119 | SIDE FRAME (R)   |         |
| 248      | 4170140207 | RADIATOR         | BK      |
|          | 4170140100 | RADIATOR         |         |
| 249      | 2048110002 | 8P DIN JACK      |         |
| 250      | 2129223009 | PUSH SWITCH      |         |
| 251      | 2129224008 | PUSH SWITCH      |         |
| 252      | 2048114008 | 4P PIN JACK      |         |
| 253      | 2118075006 | V1611V..503KA    | 50KΩA   |
|          | 2118076005 | V2620V..103KA    | 10KΩA   |
| 255      | 2048109013 | HEADPHONE JACK   |         |
| 256      | 3934013005 | FL METER         |         |
| 257      | 2124388004 | TACT SWITCH      |         |
| 258      | 1290024073 | SOFT TAPE        |         |
| 259      | 2129136028 | POWER SW         |         |
| 271      | 4428230005 | PWB GUIDE        |         |
| 272      | 4458028009 | CORD HOLDER      |         |
| 273      | 4428166108 | BIAS VOL. PLATE  |         |
| 274      | KU-52003   | BIAS ADJ PWB     |         |
| 275      | 2123315023 | VOLTAGE SELECTOR | E1 only |
| 301      | 4737500015 | 3x8 CBTS (P)     |         |
| 302      | 4737501001 | 3x10 CBTS (P)    |         |
| 303      | 4713303016 | 3x6 CBS          |         |
| 304      | 4737002005 | 3x6 CBTS (S)     |         |
| 305      | 4737004003 | 4x8 CBTS (S)     |         |
| 306      | 4737505007 | 2.6x8 CBTS (P)   |         |
| 307      | 4737003004 | 3x8 CFTS (S)     |         |
| 308      | 4737500044 | 3x8 CBTS (P) BK  |         |
| 309      | 4737503025 | 4x8 CTTS (P)     |         |
| 310      | 4713305014 | 3x10 CBS         |         |
| 311      | 4751106000 | 3W               |         |
| 312      | 4730359014 | 3x16 CRTS (2)    | E1 only |

Remarks symbols in the parts list refer to the following countries and areas.

EA: Australia

EF: French

EK: United Kingdom

EG: German

EU: U.S.A.

EC: Canada

E1: Multiple voltage model

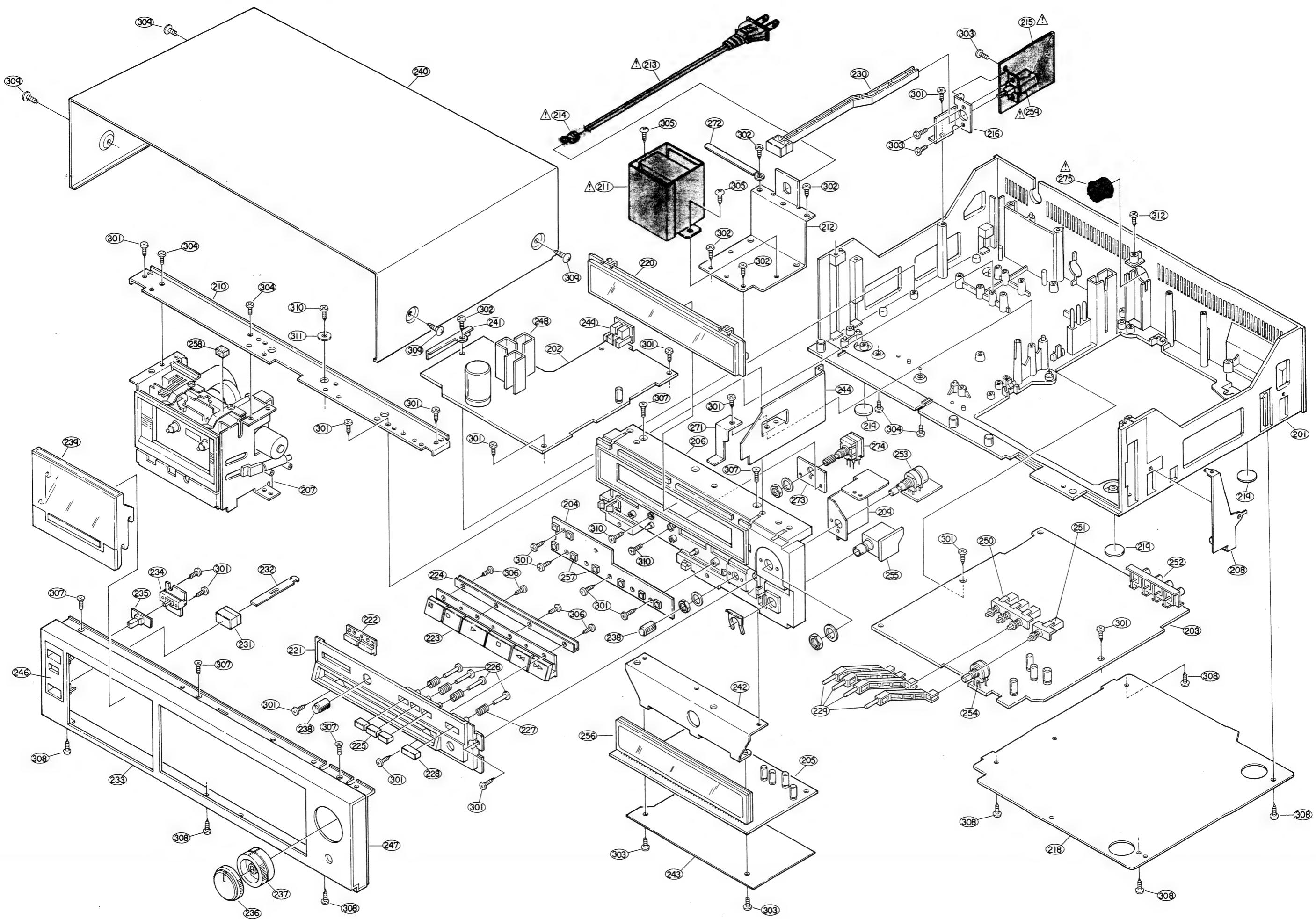
E2: European continent

\* Remarks symbols (BK) in the parts list means that the color of the front panel is Black.

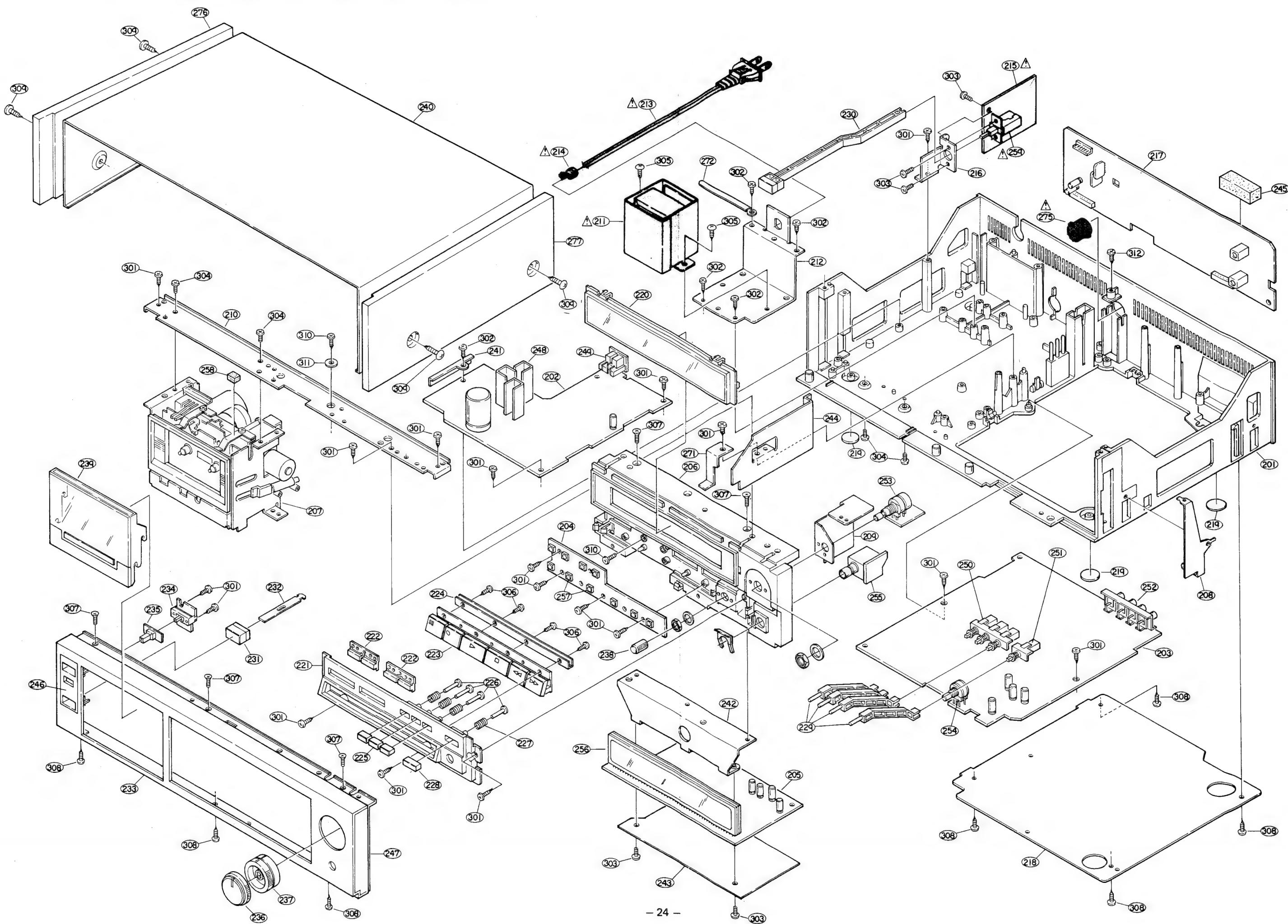
## WARNING:

Parts marked with  and/or shading have special characteristics important to safety. Be sure to use the specified parts for replacement.

EXPLODED VIEW OF CABINET AND CHASSIS GROUP (DR-M33)



#### **EXPLODED VIEW OF CABINET AND CHASSIS GROUP (DR-M44)**



## PARTS LIST OF EXPLODED VIEW (DR-M44)

| Ref. No. | Part No.   | Part Name          | Remarks     |
|----------|------------|--------------------|-------------|
| 201      | 4118341602 | CHASSIS            |             |
|          | 4118341615 | CHASSIS            | BK, E1 only |
| 202      | KU-5210    | PWR LOGIC UNIT     |             |
| 203      | KU-5200    | AUDIO PWB UNIT     |             |
| 204      | KU-5221    | CONTROL UNIT       |             |
| 205      | KU-5231    | COUNTER/METER UNIT |             |
| 206      | 1038244303 | FRONT CHASSIS      |             |
| 207      | 3388016001 | V. MECHA 55        |             |
| 208      | 4118347101 | EARTH PLATE (A)    |             |
| 209      | 4148198003 | SHIELD BRACKET     |             |
| 210      | 4118346115 | ANGLE              |             |
| 211      | 2339082001 | POWER TRANS        |             |
|          | 2339084009 | POWER TRANS        | E1 only     |
|          | 2339083107 | POWER TRANS        | EU only     |
| 212      | 4118342410 | TRANS BRACKET      |             |
|          | 4118342407 | TRANS BRACKET      | E1, EU only |
| 213      | 2062002031 | AC CORD            | E2          |
|          | 2006031026 | AC CORD            | E1          |
|          | 2006019310 | AC CORD            | EA          |
|          | 2062024006 | AC CORD WITH LABEL | EK          |
|          | 2062019008 | AC CORD            | EU          |
| 214      | 4450018004 | CORD BUSH          |             |
|          | MD-3802    | CORD BUSH          | E1, EU only |
|          | MD-2982H   | CORD BUSH          | EA only     |
| 215      | KU-52102   | POWER SW PWB       |             |
| 216      | 4118343202 | POWER SW BRACKET   |             |
| 217      | KU-04511   | CTS UNIT           |             |
| 218      | 1058089108 | BOTTOM COVER       |             |
| 219      | 4610162004 | FELT PAD           |             |
| 220      | 1438041009 | METER WINDOW       |             |
| 221      | 1038246000 | FRONT ESC          | BK          |
|          | 1038246039 | FRONT ESC          |             |
| 222      | 1138174108 | PUSH KNOB (A)      | BK          |
|          | 1138174111 | PUSH KNOB (A)      |             |
| 223      | 1138175204 | CONTROL BUTTON     | BK          |
|          | 1138175217 | CONTROL BUTTON     |             |
| 224      | 4118421001 | PRESS BAR          |             |
| 225      | 1138179006 | PUSH BUTTON (A)    | BK          |
|          | 1138179019 | BUSH BUTTON (A)    |             |
| 226      | 1138180008 | BUTTON SHAFT       |             |
| 227      | 4638623004 | SPRING             |             |
| 228      | 1138181007 | PUSH BUTTON (B)    | BK          |
|          | 1138181018 | PUSH BUTTON (B)    |             |
| 229      | 4318098108 | PUSH SW LEVER      |             |
| 230      | 4318101008 | P.S. LEVER ASS'Y   | BK          |
|          | 4318101011 | P.S. LEVER ASSY    |             |
| 231      | 4318102007 | EJECT KNOB ASS'Y   | BK          |
|          | 4318102010 | EJECT KNOB ASS'Y   |             |
| 232      | 4318104102 | EJECT PLATE        |             |
| 233      | 1038247135 | FRONT PANEL ASS'Y  | BK          |
|          | 1038247151 | FRONT PANEL ASS'Y  |             |
| 234      | KU-52101   | TIMER SW PWB       |             |
| 235      | 1138155130 | SLIDE KNOB (B)     | BK          |
|          | 1138155143 | SLIDE KNOB (B)     |             |

| Ref. No. | Part No.   | Part Name        | Remarks    |
|----------|------------|------------------|------------|
| 236      | 1128112109 | VOL. KNOB (A)    | BK         |
|          | 1128112112 | VOL. KNOB (A)    |            |
| 237      | 1128113108 | VOL. KNOB (B)    | BK         |
|          | 1128113111 | VOL. KNOB (B)    |            |
| 238      | 1128114000 | VOL. KNOB (C)    | BK         |
|          | 1128114013 | VOL. KNOB (C)    |            |
| 239      | 1038253116 | C. WINDOW ASS'Y  | BK         |
|          | 1038253132 | C. WINDOW ASS'Y  |            |
| 240      | 1028319251 | TOP COVER        | BK         |
|          | 1028319248 | TOP COVER        |            |
|          | 1028319277 | TOP COVER        | BK, EA     |
|          | 1028319235 | TOP COVER        | EA         |
| 241      | 4428055002 | P.W.B. SUPPORT   |            |
| 242      | 4428141000 | METER HOLDER     |            |
| 243      | 4118420109 | SHIELD SHEET     |            |
| 244      | 4128747102 | SHIELD BRACKET   |            |
| 245      | 4618135004 | CUSHION (C)      |            |
| 246      | 1038249104 | SIDE FRAME (L)   | BK         |
|          | 1038249117 | SIDE FRAME (L)   |            |
| 247      | 1038250106 | SIDE FRAME (R)   | BK         |
|          | 1038250119 | SIDE FRAME (R)   |            |
| 248      | 4170140207 | RADIATOR         |            |
| 249      | 2048110002 | 8P DIN JACK      |            |
| 250      | 2129223009 | PUSH SWITCH      |            |
| 251      | 2129224008 | PUSH SWITCH      |            |
| 252      | 2048114008 | 4P PIN JACK      |            |
| 253      | 2118075006 | V1611V..503KA    |            |
| 254      | 2118076005 | V2620V..103KA    |            |
| 255      | 2048109013 | HEADPHONE JACK   |            |
| 256      | 3934013005 | FL METER         |            |
| 257      | 2124388004 | TACT SWITCH      |            |
| 258      | 1290024073 | SOFT TAPE        |            |
| 259      | 2129136028 | POWER SW         |            |
| 271      | 4428230005 | PWB GUIDE        |            |
| 272      | 4458028009 | CORD HOLDER      |            |
| 275      | 2123315023 | VOLTAGE SELECTOR | E1 only    |
| 276      | 1018418007 | WOOD BOARD (L)   | E1, EA, EU |
| 277      | 1018419006 | WOOD BOARD (R)   | E1, EA, EU |
| 301      | 4737500015 | 3x8 CBTS (P)     |            |
| 302      | 4737501001 | 3x10CBTS (P)     |            |
| 303      | 4713303016 | 3x6 CBS          |            |
| 304      | 4737002005 | 3x6 CBTS (S)     |            |
| 305      | 4737004003 | 4x8 CBTS (S)     |            |
| 306      | 4737505007 | 2.6x8 CBTS (P)   |            |
| 307      | 4737003004 | 3x8 CFTS (S)     |            |
| 308      | 4737500044 | 3x8 CBTS (P) BK  |            |
| 309      | 4737503025 | 4x8 CTTS (P)     |            |
| 310      | 4713305014 | 3x10 CBS         |            |
| 311      | 4751106000 | 3W               |            |

Remarks symbols in the parts list refer to the following countries and areas.

EA: Australia

EF: French

EK: United Kingdom

EG: German

EU: U.S.A.

EC: Canada

E1: Multiple voltage model

E2: European continent

\* Remarks symbols (BK) in the parts list means that the color of the front panel is Black.

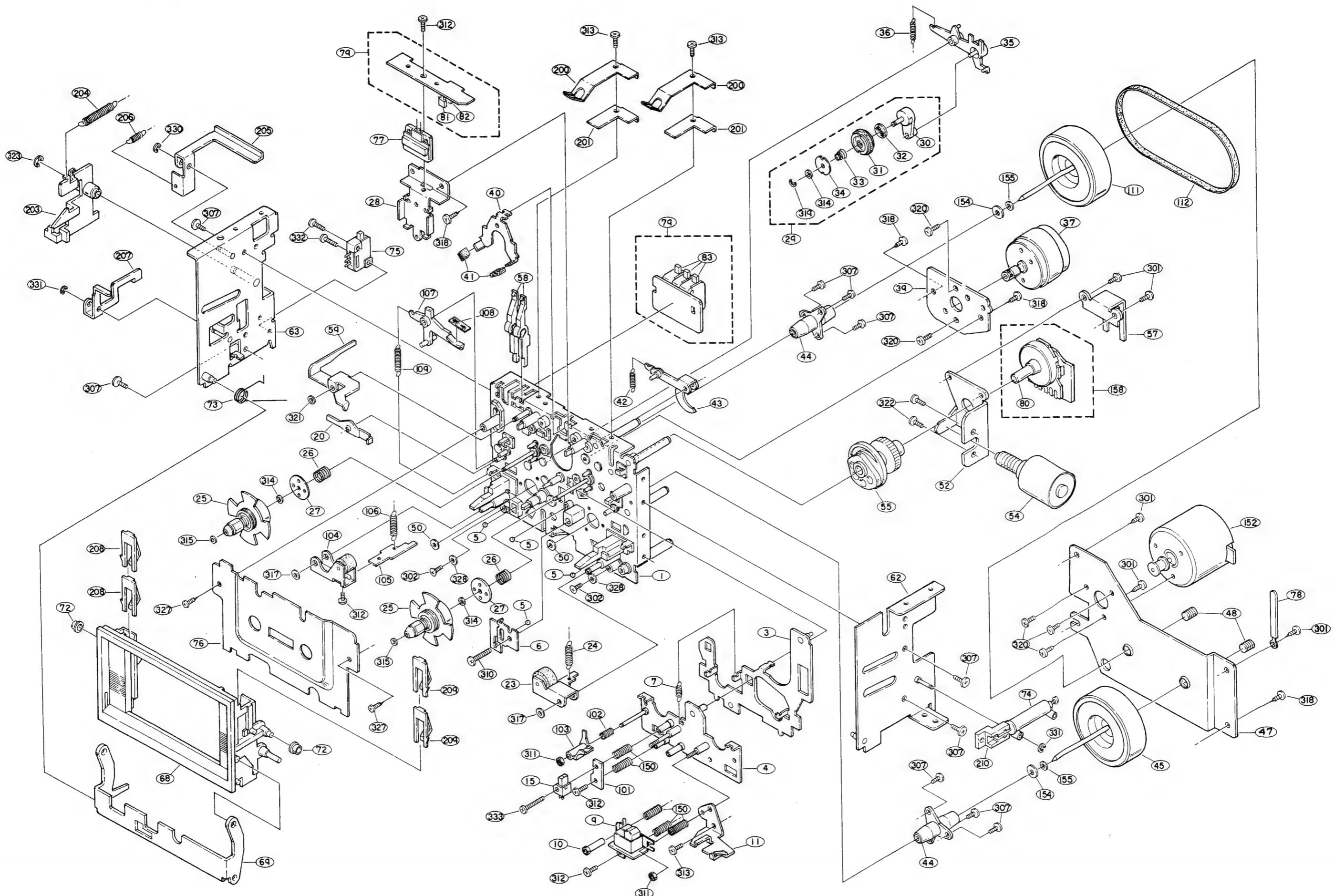
### WARNING:

Parts marked with and/or shading have special characteristics important to safety. Be sure to use the specified parts for replacement.

PARTS LIST OF MECHANISM 81 UNIT (DR-M33)

| Ref. No. | Part No.   | Part Name          | Remarks | Ref. No. | Part No.   | Part Name            | Remarks |
|----------|------------|--------------------|---------|----------|------------|----------------------|---------|
| 1        | 4118339300 | MECHA BASE ASS     |         | 101      | 4428167000 | E HEAD BASE          |         |
| 3        | 4318076308 | HEAD SLIDER ASS    |         | 102      | 4638621103 | SPRING               |         |
| 4        | 4318106003 | HEAD PLATE ASS     |         | 103      | 4338193009 | TAPE GUIDE           |         |
| 5        | 4258011009 | STEEL BALL D3      |         | 104      | 4338196103 | P-ROLLER ARM L       |         |
| 6        | 4318080200 | BALL GUIDE PLATE   |         | 105      | 4338198101 | P-ROLLER ARM PLATE   |         |
| 7        | 4638230002 | SPRING             |         | 106      | 4638260001 | SPRING               |         |
| 9        | 3918076107 | R/P HEAD           |         | 107      | 4338201205 | BACK TENSION ARM     |         |
| 10       | 4438671104 | SPECIAL NUT        |         | 108      | 4618125108 | FRICITION FELT       |         |
| 11       | 4418994102 | CORD HOLDER        |         | 109      | 4638234105 | SPRING               |         |
| 15       | 3918825002 | ERASE HEAD         |         | 111      | 4218381229 | C WHEEL (S) ASS      |         |
| 20       | 4338224208 | STOPPER            |         | 112      | 4238028106 | BELT                 |         |
| 23       | 4338194105 | P ROLLER ARM ASS   |         | 150      | 4638819012 | SPRING               |         |
| 24       | 4638231108 | SPRING             |         | 152      | 2178083106 | CP MOTOR SUB ASS     |         |
| 25       | 4218400003 | REEL ASS           |         | 154      | 4770090087 | WASHER               |         |
| 26       | 4638261000 | SPRING             |         | 155      | 4770090016 | WASHER               |         |
| 27       | 4338199003 | FRICITION PLATE    |         | 158      | KU-5100    | ENCODER PWB          |         |
| 28       | 4418961300 | LAMP HOLDER        |         | 200      | 4638829206 | CASSETTE SPRING      |         |
| 29       | 4338238414 | I. ARM (B) G ASS   |         | 201      | 4428154107 | CP SUPPORT           |         |
| 30       | 4338239109 | IDLER ARM (B) ASS  |         | 203      | 4338269302 | HOOK                 |         |
| 31       | 4218324312 | IDLER ASS          |         | 204      | 4638256002 | SPRING               |         |
| 32       | 4618126107 | FRICITION FELT     |         | 205      | 4128829004 | ANGLE                |         |
| 33       | 4638625206 | SPRING             |         | 206      | 4638257001 | SPRING               |         |
| 34       | 4428029106 | THRUST WASHER      |         | 207      | 4318103006 | SW LEVER             |         |
| 35       | 4338236209 | IDLER ARM (A) ASS  |         | 208      | 1038243304 | CASSETTE SUPPORT (L) |         |
| 36       | 4638244108 | SPRING             |         | 209      | 1038243317 | CASSETTE SUPPORT (R) |         |
| 37       | 2178088101 | DC MOTOR ASS       |         | 210      | 4338271109 | DAMPER GUIDE         |         |
| 39       | 4418962309 | DC MOTOR FIX PLATE |         | 301      | 4737002005 | 3x6 CBTS (S)         |         |
| 40       | 4318081306 | BRAKE              |         | 302      | 4737500028 | 3x8 CFTS (P)         |         |
| 41       | 4618127106 | BRAKE SHOE         |         | 307      | 4713202010 | 2.6x5 CBS            |         |
| 42       | 4638234105 | SPRING             |         | 310      | 4713802025 | 2.6x14 CBS           |         |
| 43       | 4338232203 | BRAKE ARM ASS      |         | 311      | 4756020000 | 2N                   |         |
| 44       | 4438648302 | METAL HOUSING ASS  |         | 312      | 4713102013 | 2x5 CBS              |         |
| 45       | 4218381203 | C. WHEEL (S) ASS   |         | 313      | 4713201011 | 2.6x4 CBS            |         |
| 47       | 4128784217 | BACK PLATE         |         | 314      | 4770090003 | WASHER               |         |
| 48       | 4438771004 | CAPSTAN STOPPER    |         | 315      | 4751119107 | SLIT WASHER          |         |
| 50       | 4770090074 | WASHER             |         | 317      | 4751121108 | SLIT WASHER          |         |
| 52       | 4418966208 | CAM MOTOR HOLDER   |         | 318      | 4737500002 | 3x6 CBTS (P)         |         |
| 54       | 2178080206 | CAM MOTOR ASS      |         | 319      | 4761000002 | 1.5E RING            |         |
| 55       | 4248027304 | CAM                |         | 320      | 4713802012 | 2.6x3 CBS            |         |
| 57       | 4428018104 | ENCODER BRACKET    |         | 321      | 4751120109 | SLIT WASHER          |         |
| 58       | 4338225304 | HOLE SENSOR (1)    |         | 322      | 4713801039 | 2x3 CBS              |         |
| 59       | 4338226400 | HOLE SENSOR (2)    |         | 323      | 4761003009 | 3E RING              |         |
| 62       | 4428147208 | RIGHT STAY ASS     |         | 327      | 4730154028 | 2x8 CRTS             |         |
| 63       | 4428145200 | LEFT STAY ASS      |         | 328      | 4751005004 | 4W                   |         |
| 68       | 1038242208 | C. BOX (A)         |         | 330      | 4761002000 | 2.5E RING            |         |
| 69       | 4338270304 | CASSETTE BOX       |         | 331      | 4761001001 | 2E RING              |         |
| 72       | 4318097002 | COLLAR             |         | 332      | 4713204018 | 2.6x8 CBS            |         |
| 73       | 4638236116 | BOX SPRING         |         | 333      | 4712804008 | 2x10 CPS             |         |
| 74       | 4698013104 | AIR DUMPPER        |         |          |            |                      |         |
| 75       | 2129200006 | SLIDE SWITCH       |         |          |            |                      |         |
| 76       | 1448508105 | ESC PLATE          |         |          |            |                      |         |
| 77       | 3939179009 | LN0105 GP3         |         |          |            |                      |         |
| 78       | 4458028009 | CORD HOLDER        |         |          |            |                      |         |
| 79       | KU-5100    | R PULSE SENS PWB   |         |          |            |                      |         |
| 80       | 2123331201 | ROTARY ENCODER     |         |          |            |                      |         |
| 81       | 3939178000 | LN25RCP            |         |          |            |                      |         |
| 82       | 3939026000 | PN150              |         |          |            |                      |         |
| 83       | 2129201005 | SLIDE SWITCH       |         |          |            |                      |         |

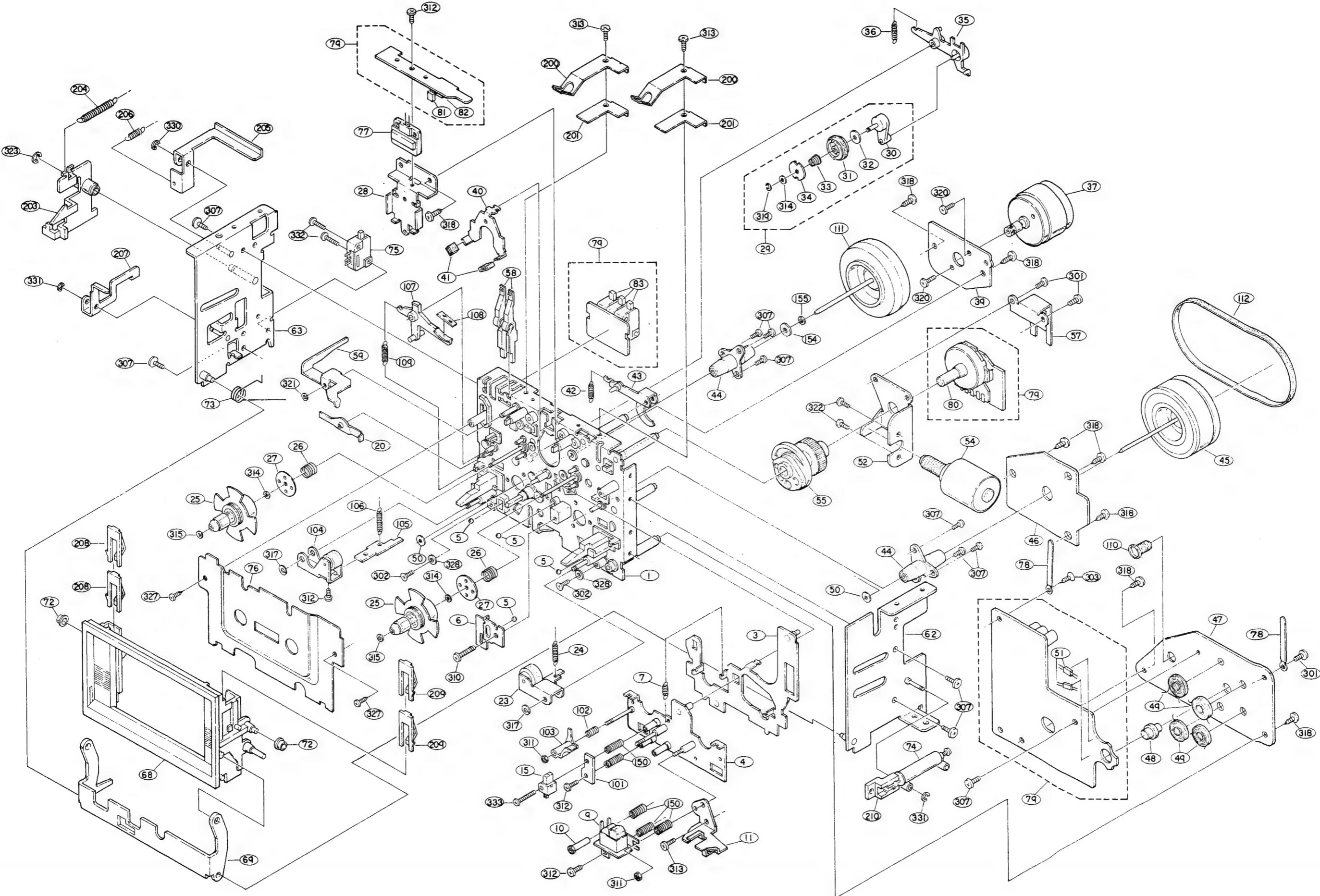
EXPLODED VIEW OF MECHANISM 81 UNIT (DR-M33)



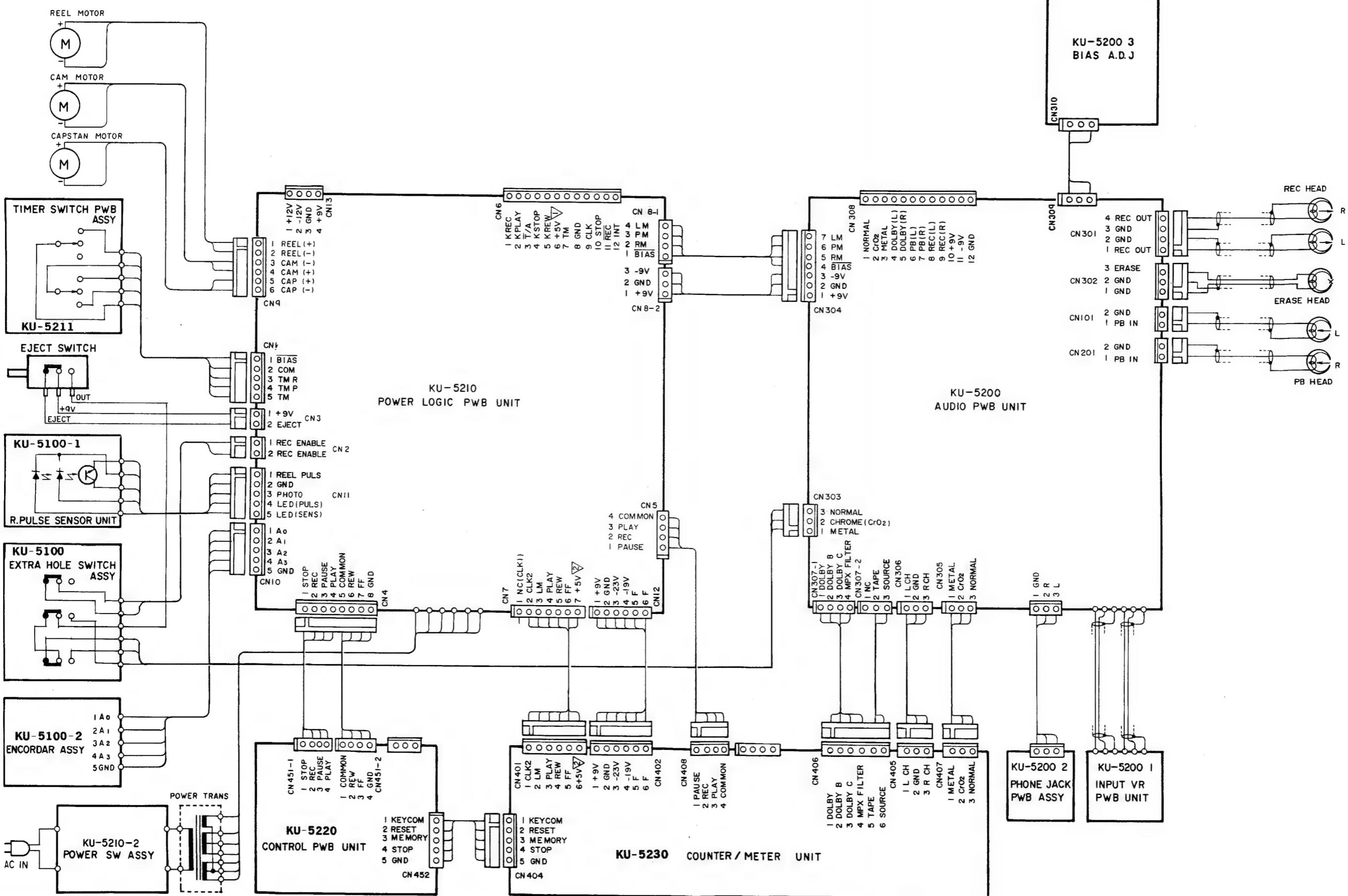
**PARTS LIST OF MECHANISM 55 UNIT (DR-M44)**

| Ref. No. | Part No.   | Part Name          | Remarks | Ref. No. | Part No.   | Part Name            | Remarks |
|----------|------------|--------------------|---------|----------|------------|----------------------|---------|
| 1        | 4118339300 | MECHA BASE ASS     |         | 78       | 4458028009 | CORD HOLDER          |         |
| 3        | 4318076308 | HEAD SLIDER ASS    |         | 79       | KU-0455B   | ENCORDER ASS         |         |
| 4        | 4318106003 | HEAD PLATE ASS'Y   |         | 80       | 2123331201 | ROTARY ENCODER       |         |
| 5        | 4258011009 | STEEL BALL D3      |         | 81       | 3939178000 | LN25RCP              |         |
| 6        | 4318080200 | BALL GUIDE PLATE   |         | 82       | 3939026000 | PN150                |         |
| 7        | 4638230002 | SPRING             |         | 83       | 2129201005 | SLIDE SWITCH         |         |
| 9        | 3918076107 | R/P HEAD           |         | 101      | 4428167000 | E HEAD BASE          |         |
| 10       | 4438671104 | SPECIAL NUT        |         | 102      | 4638621103 | SPRING               |         |
| 11       | 4418994102 | CORD HOLDER        |         | 103      | 4338193009 | TAPE GUIDE           |         |
| 15       | 3918825002 | ERASE HEAD         |         | 104      | 4338196103 | P-ROLLER ARM L       |         |
| 20       | 4338224208 | STOPPER            |         | 105      | 4338198101 | P-ROLLER ARM PLATE   |         |
| 23       | 4338194105 | P ROLLER ARM ASS   |         | 106      | 4638260001 | SPRING               |         |
| 24       | 4638237008 | SPRING             |         | 107      | 4338201205 | BACK TENSION ARM     |         |
| 25       | 4218400003 | REEL ASS           |         | 108      | 4618125108 | FRICITION FELT       |         |
| 26       | 4638261000 | SPRING             |         | 109      | 4638234105 | SPRING               |         |
| 27       | 4338199003 | FRICTION PLATE     |         | 110      | 4258009008 | CAPSTAN SUPPORT (B)  |         |
| 28       | 4418961300 | LAMP HOLDER        |         | 111      | 4218365300 | CAPSTAN WHEEL ASS    |         |
| 29       | 4338238414 | I. ARM (B) G ASS   |         | 112      | 4238026108 | BELT                 |         |
| 30       | 4338239109 | IDLER ARM (B) ASS  |         | 150      | 4638819012 | SPRING               |         |
| 31       | 4218324312 | IDLER ASS'Y        |         | 154      | 4770090087 | WASHER               |         |
| 32       | 4618126107 | FRICITION FELT     |         | 155      | 4770090016 | WASHER               |         |
| 33       | 4638625206 | SPRING             |         | 200      | 4638829206 | CASSETTE SPRING      |         |
| 34       | 4428029106 | THRUST WASHER      |         | 201      | 4428154107 | CP SUPPORT           |         |
| 35       | 4338236209 | IDLER ARM (A) ASS  |         | 203      | 4338269302 | HOOK                 |         |
| 36       | 4638244108 | SPRING             |         | 204      | 4638256002 | SPRING               |         |
| 37       | 2178088101 | DC MOTOR ASS       |         | 205      | 4128829004 | ANGLE                |         |
| 39       | 4418962309 | DC MOTOR FIX PLATE |         | 206      | 4638257001 | SPRING               |         |
| 40       | 4318081306 | BRAKE              |         | 207      | 4318103006 | SW LEVER             |         |
| 41       | 4618127106 | BRAKE SHOE         |         | 208      | 1038243304 | CASSETTE SUPPORT (L) |         |
| 42       | 4638234105 | SPRING             |         | 209      | 1038243317 | CASSETTE SUPPORT (R) |         |
| 43       | 4338232203 | BRAKE ARM ASS      |         | 210      | 4338271109 | DAMPER GUIDE         |         |
| 44       | 4438648302 | METAL HOUSING      |         | 301      | 4737002005 | 3x6 CBTS (S)         |         |
| 45       | 4218355116 | CAPSTAN W SUB      |         | 302      | 4737500028 | 3x8 CFTS (P)         |         |
| 46       | 2228530004 | CIRCUIT BOARD      |         | 303      | 4737003004 | 3x8 CFTS (S)         |         |
| 47       | 4428041003 | BACK PLATE         |         | 307      | 4713202010 | 2.6x5 CBS            |         |
| 48       | 4438650400 | CAPSTAN STOPPER    |         | 310      | 4713802025 | 2.6x14 CBS           |         |
| 49       | 3468148307 | STATOR COIL        |         | 311      | 4756020000 | 2N                   |         |
| 50       | 4770090074 | WASHER             |         | 312      | 4713102013 | 2x5 CBS              |         |
| 51       | 2760303016 | HL-300             |         | 313      | 4713201011 | 2.6x4 CBS            |         |
| 52       | 4418966208 | CAM MOTOR HOLDER   |         | 314      | 4770090003 | WASHER               |         |
| 54       | 2178080206 | CAM MOTOR ASS      |         | 315      | 4751119107 | SLIT WASHER          |         |
| 55       | 4248027304 | CAM                |         | 317      | 4751121108 | SLIT WASHER          |         |
| 57       | 4428018104 | ENCODER BRACKET    |         | 318      | 4737500002 | 3x6 CBTS (P)         |         |
| 58       | 4338225304 | HOLE SENSOR (1)    |         | 319      | 4761000002 | 1.5E RING            |         |
| 59       | 4338226400 | HOLE SENSOR (2)    |         | 320      | 4713802012 | 2.6x3 CBS            |         |
| 62       | 4428147208 | RIGHT STAY ASS     |         | 321      | 4751120109 | SLIT WASHER          |         |
| 63       | 4428145200 | LEFT STAY ASS      |         | 322      | 4713801039 | 2x3 CBS              |         |
| 68       | 1038242208 | C. BOX (A)         |         | 323      | 4761003009 | 3E RING              |         |
| 69       | 4338270304 | CASSETTE BOX (B)   |         | 327      | 4730154028 | 2x8 CRTS             |         |
| 72       | 4318097002 | COLLAR             |         | 328      | 4751005004 | 4W                   |         |
| 73       | 4638236116 | BOX SPRING         |         | 330      | 4761002000 | 2.5E RING            |         |
| 74       | 4698013104 | AIR DUMPPER        |         | 331      | 4761001001 | 2E RING              |         |
| 75       | 2129200006 | SLIDE SWITCH       |         | 332      | 4713204018 | 2.6x8 CBS            |         |
| 76       | 1448508105 | ESC PLATE          |         | 333      | 4712804008 | 2x10 CPS             |         |
| 77       | 3939179009 | LN0105 GP3         |         |          |            |                      |         |

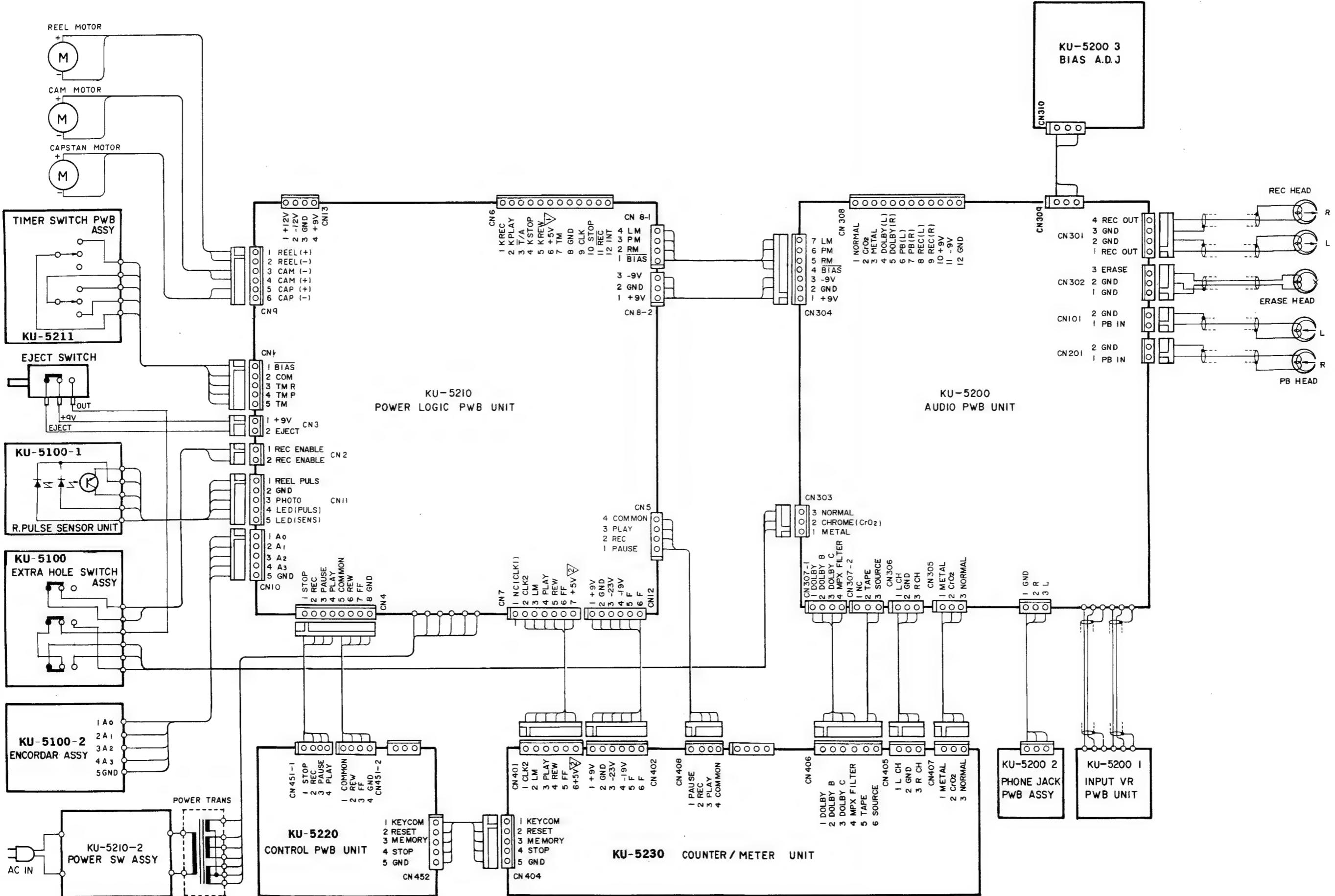
**EXPLODED VIEW OF MECHANISM 55 UNIT (DR-M44)**



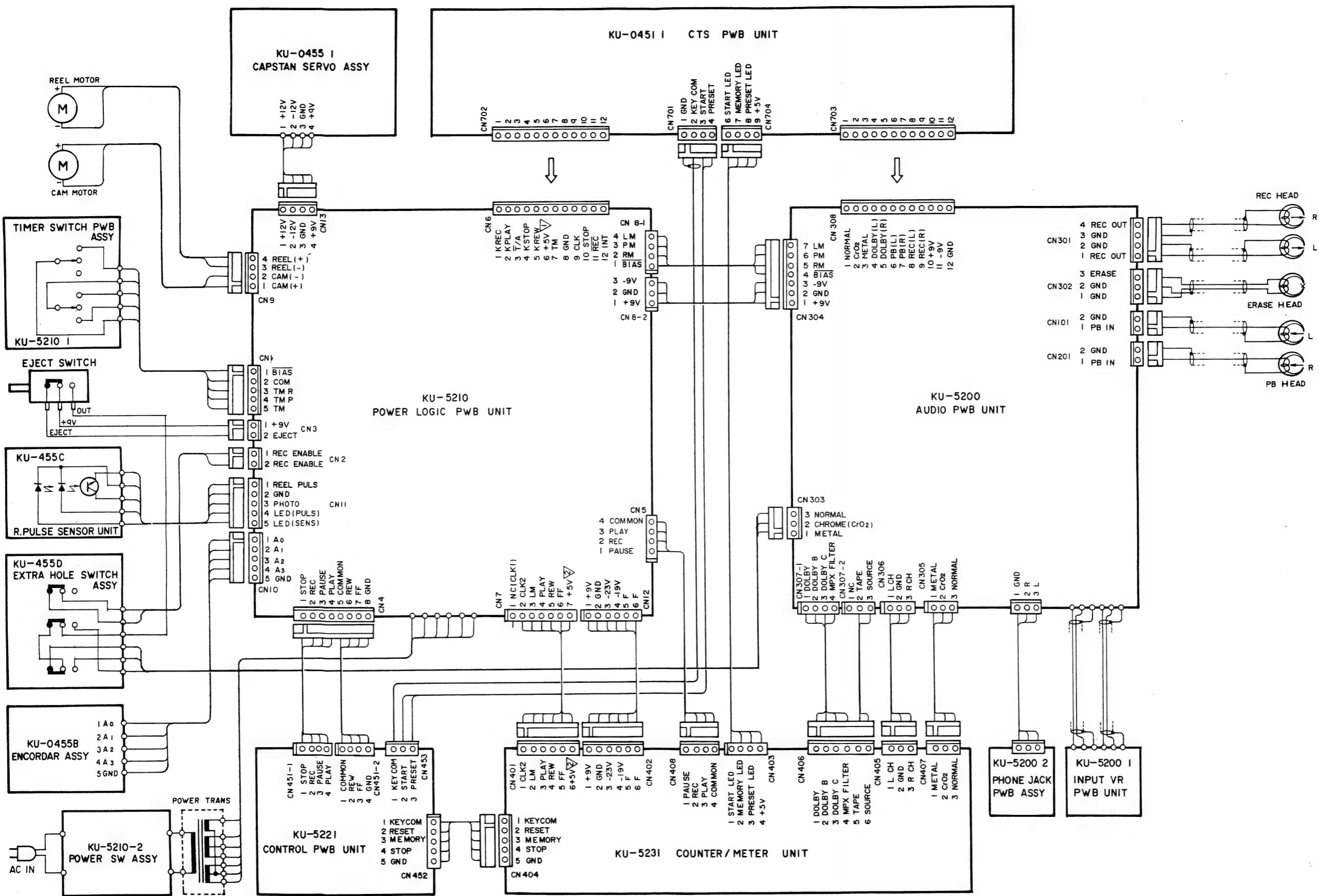
CONNECTIONS OF P.W. BOARD (DR-M33)



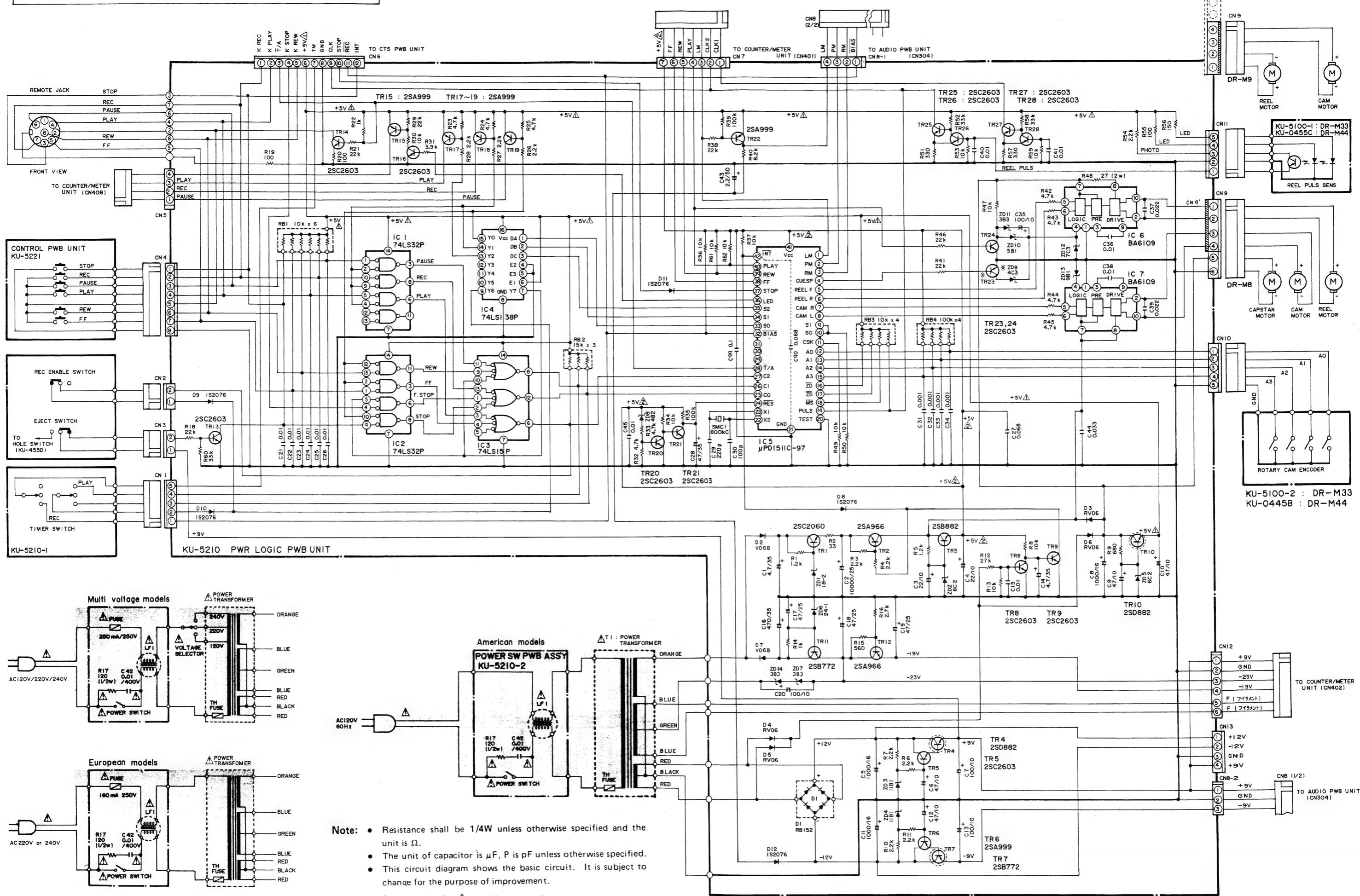
CONNECTIONS OF P.W. BOARD (DR-M33)



CONNECTIONS OF P.W. BOARD (DR-M44)



# SCHEMATIC DIAGRAM OF POWER AND LOGIC UNIT

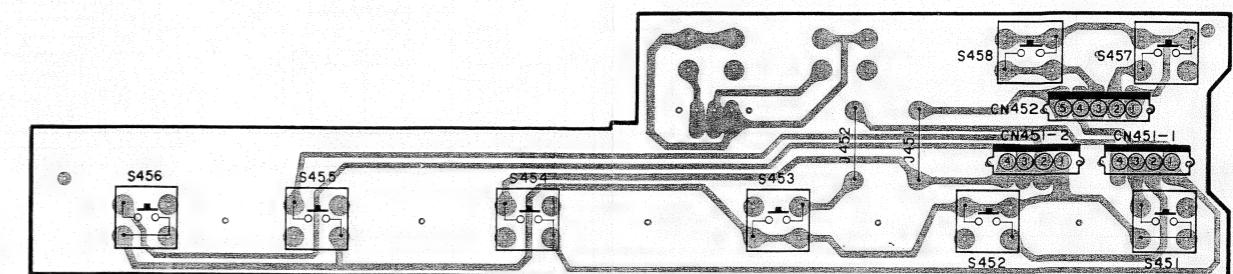
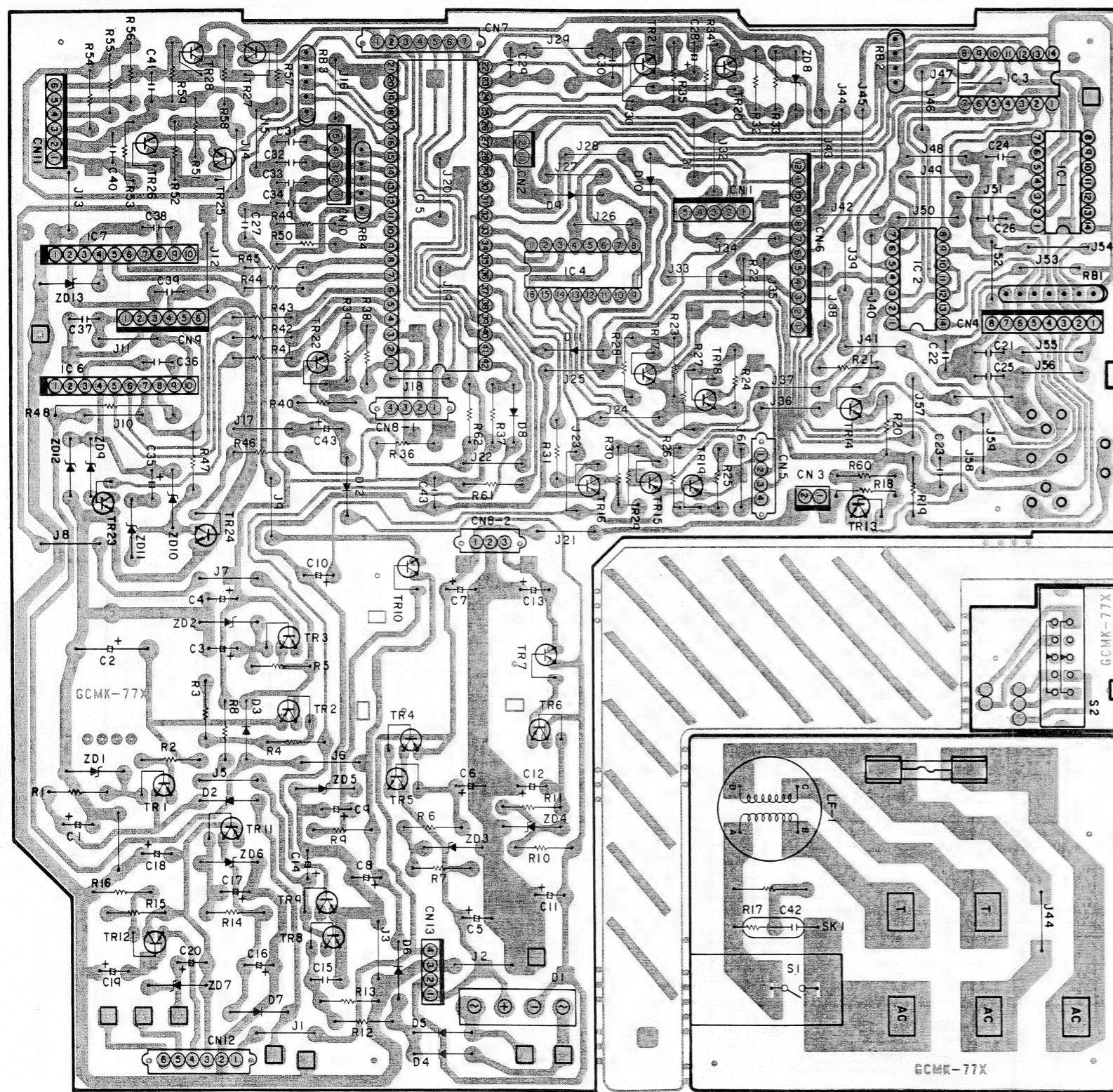


Note: • Resistance shall be 1/4W unless otherwise specified and the unit is  $\Omega$ .  
• The unit of capacitor is  $\mu\text{F}$ , P is  $\text{pF}$  unless otherwise specified.  
• This circuit diagram shows the basic circuit. It is subject to change for the purpose of improvement.  
• Parts marked with  $\triangle$  are of importance in respect to the safety, use the specified type without fail.

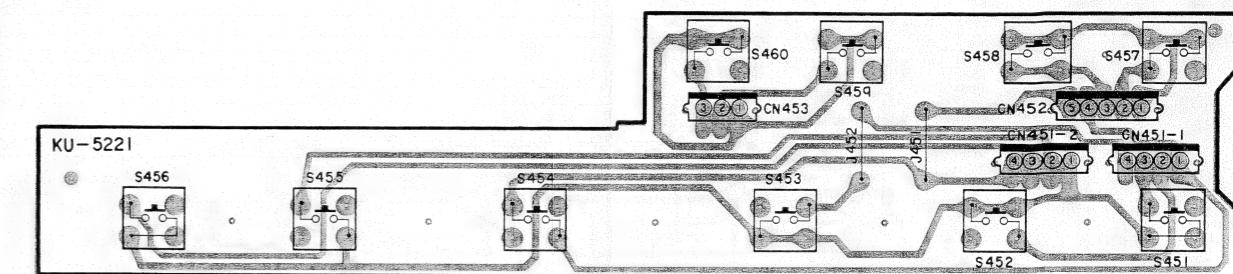
P.W. BOARD

KU-5220 CONTROL UNIT (DR-M33)

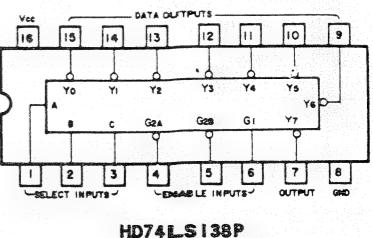
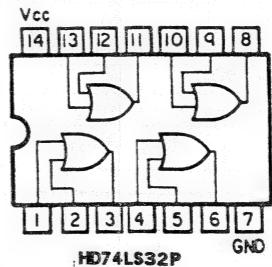
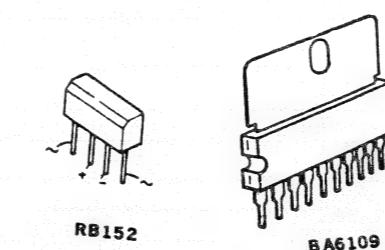
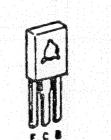
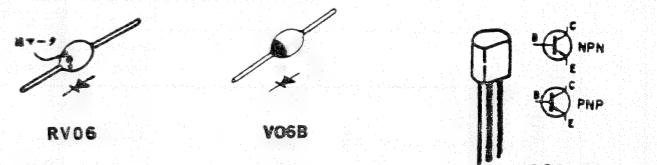
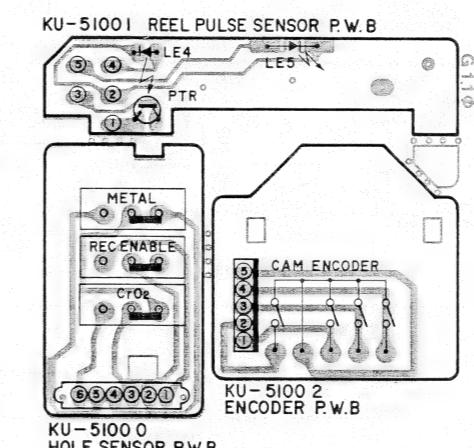
KU-5210 POWER AND LOGIC UNIT



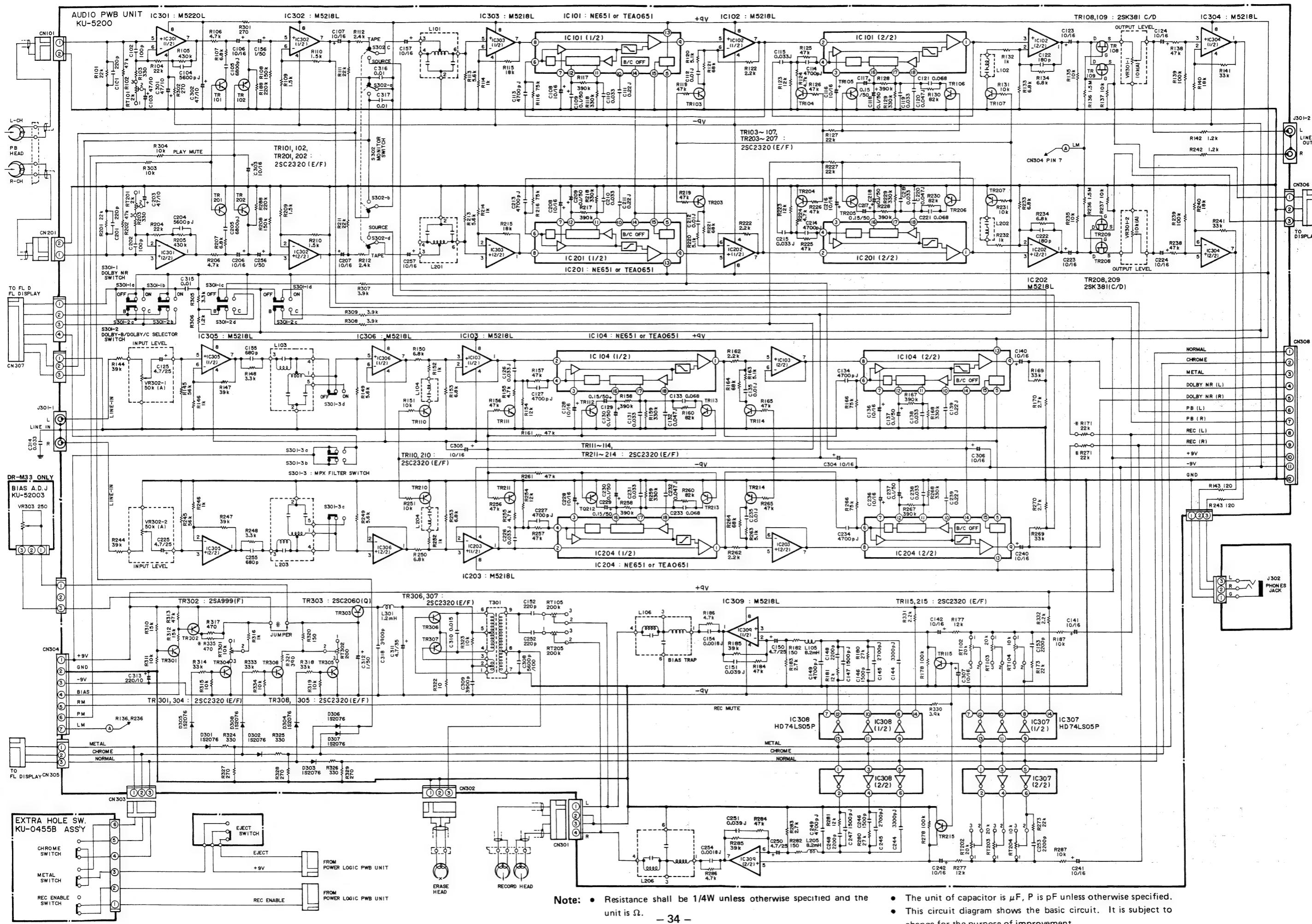
KU-5221 CONTROL UNIT (DR-M44)



KU-5100 MECHANISM UNIT



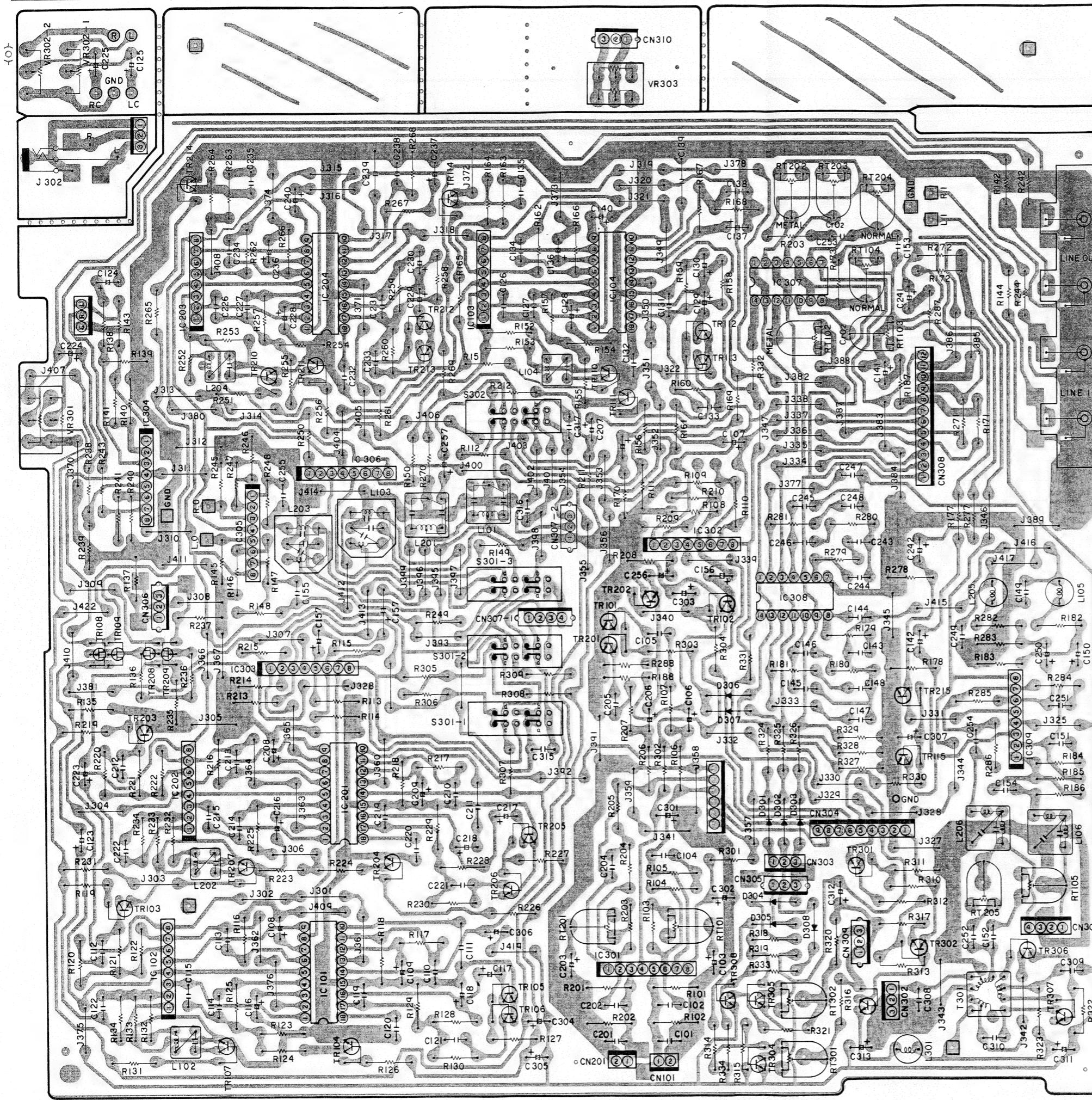
# SCHEMATIC DIAGRAM OF AUDIO AMP UNIT



Note: • Resistance shall be 1/4W unless otherwise specified and the unit is Ω.  
• The unit of capacitor is  $\mu\text{F}$ , P is  $\text{pF}$  unless otherwise specified.  
• This circuit diagram shows the basic circuit. It is subject to change for the purpose of improvement.

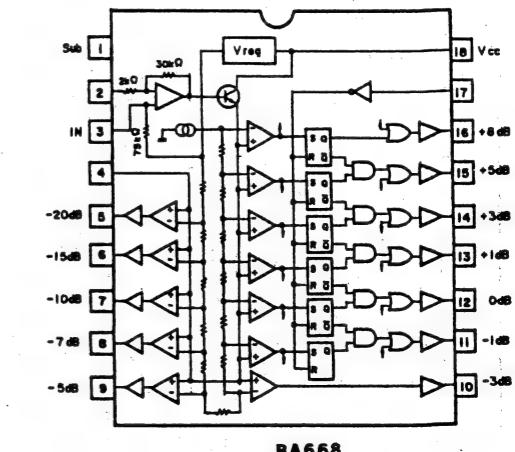
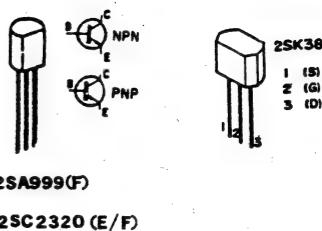
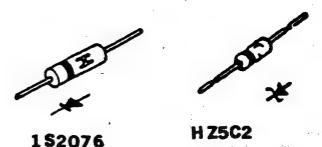
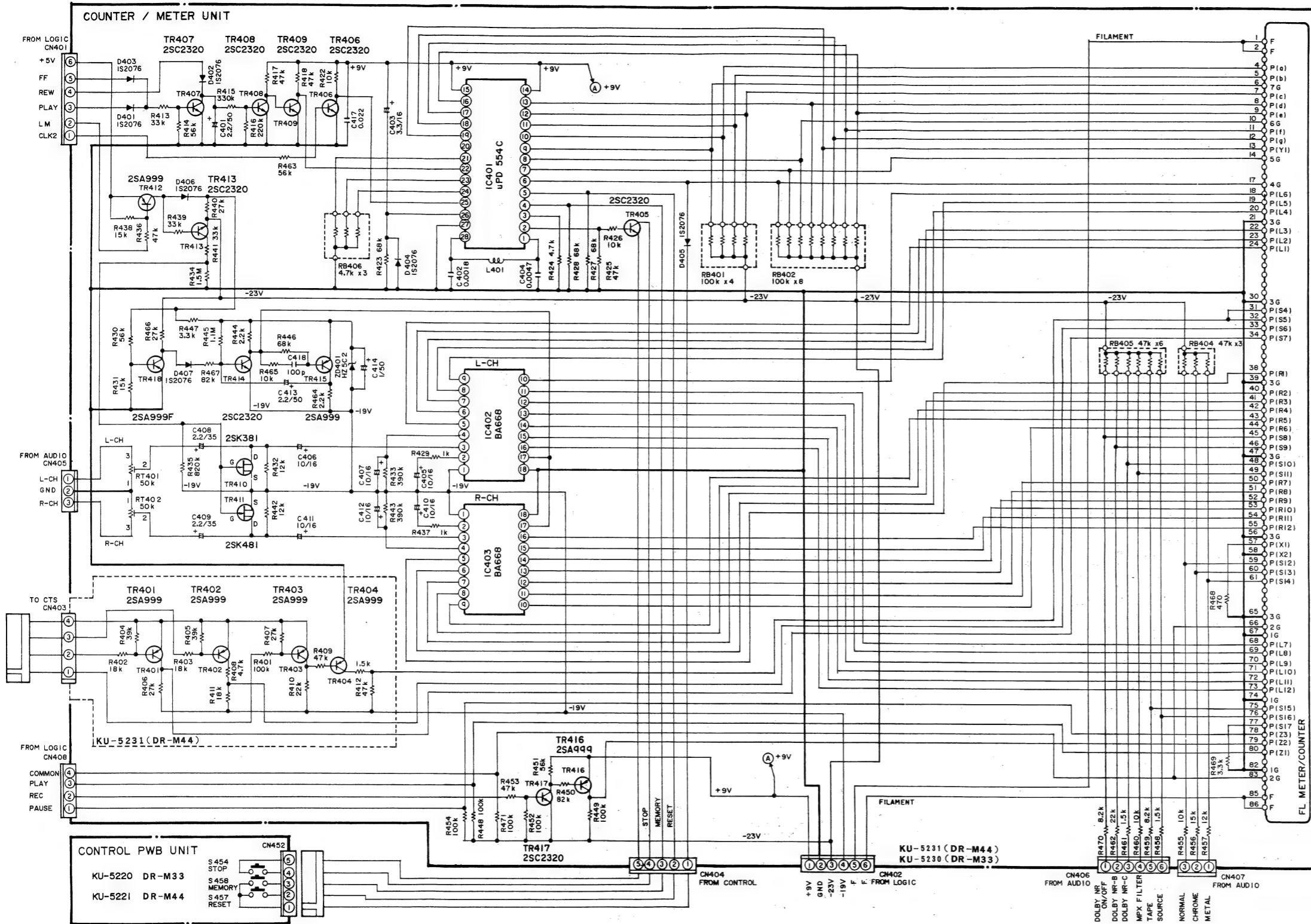
P.W. BOARD

## KU-5200 AUDIO AMP UNIT

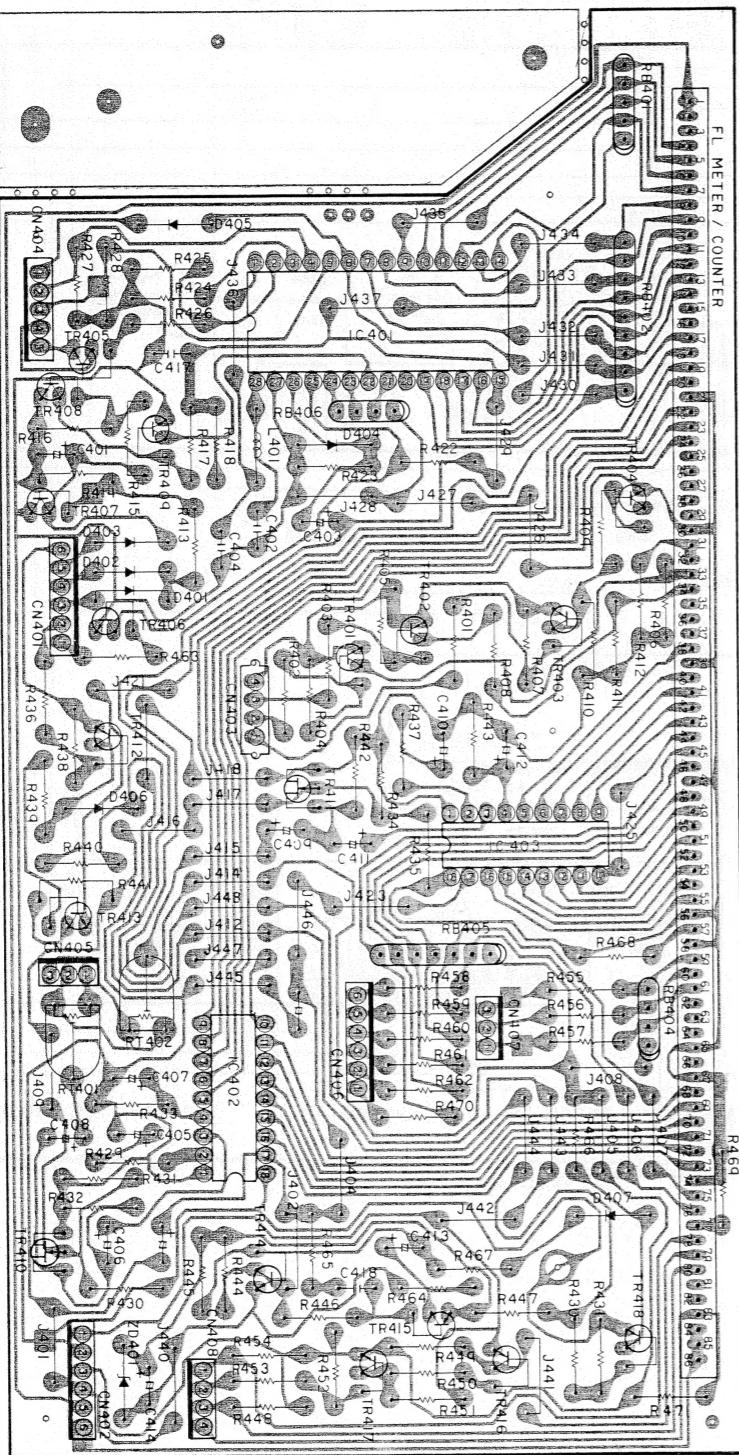


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# SCHEMATIC DIAGRAM OF FL COUNTER UNIT



## KU-5230/5231 FL COUNTER UNIT

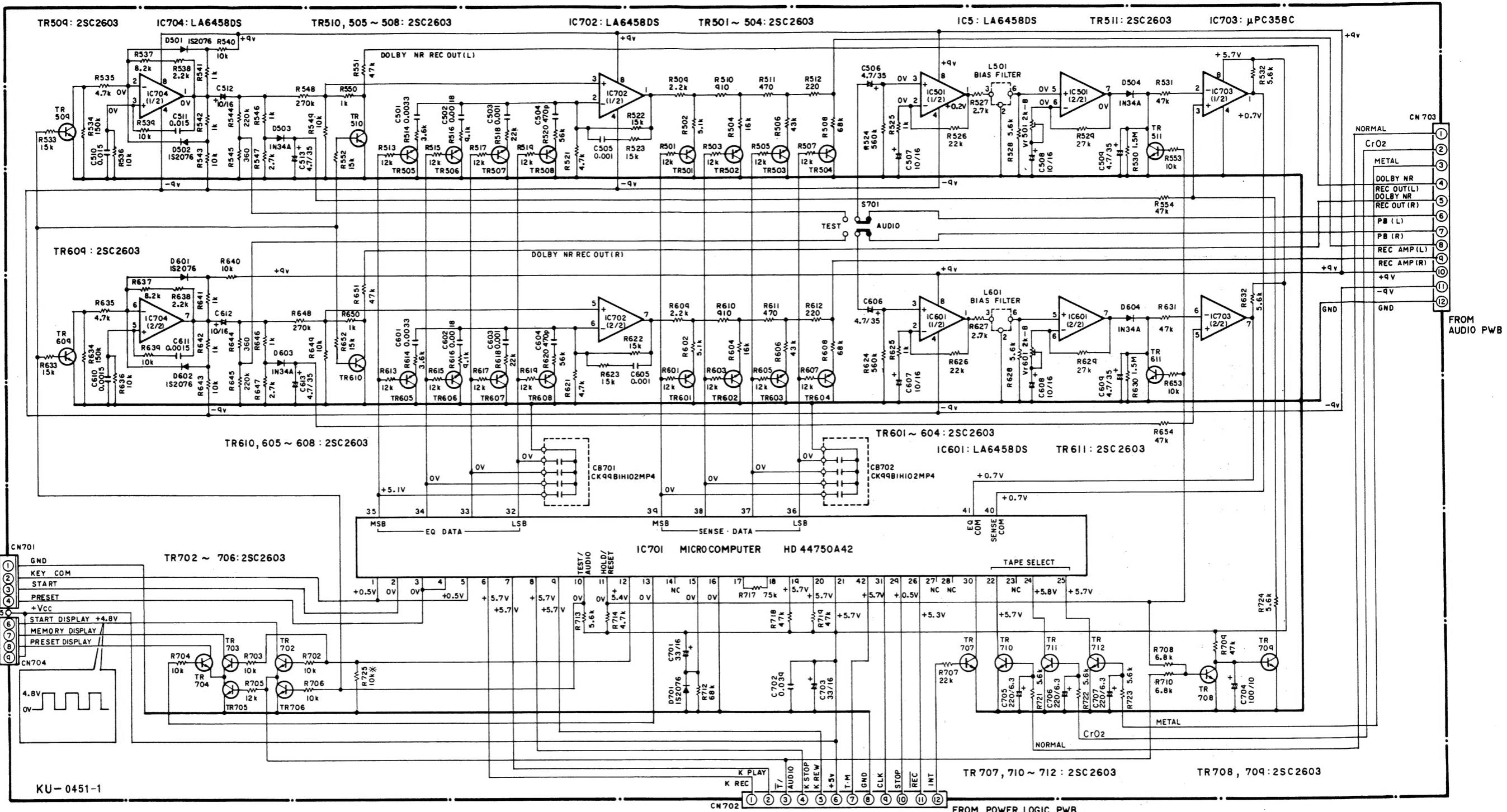


KU-5230 (DR-M33)

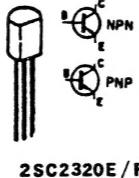
KU-5231 (DR-M44)

| Terminal Number | Name  | Function                   | Terminal Number | Name   | Function   |
|-----------------|-------|----------------------------|-----------------|--------|--|
| 1               | F     | Filament                   | 46              | P(S9)  | B display plate  |
| 2               | F     | Filament                   | 47              | 3G     | -  |
| 3               | NP    | -                          | 48              | P(S10) | C display plate  |
| 4               | P(a)  | Plate (a)                  | 49              | P(S11) | FILTER display plate   |
| 5               | P(b)  | Plate (b)                  | 50              | P(R7)  | Rch [-1] dB display plate                                    |
| 6               | 7G    | Counter-4 digit counter    | 51              | P(R8)  | Rch [0] dB display plate                                     |
| 7               | P(c)  | Plate (c)                  | 52              | P(R9)  | Rch [+1] dB display plate                                    |
| 8               | P(d)  | Plate (d)                  | 53              | P(R10) | Rch [+3] dB display plate                                    |
| 9               | P(e)  | Plate (e)                  | 54              | P(R11) | Rch [+5] dB display plate                                    |
| 10              | 6G    | Counter-3 digit counter    | 55              | P(R12) | Rch [+8] dB display plate                                    |
| 11              | P(f)  | Plate (f)                  | 56              | 3G     | -  |
| 12              | P(g)  | Plate (g)                  | 57              | P(X1)  | Blue illumination level meter display and TAPE display plate |
| 13              | P(Y1) | MEMORY STOP display plate  | 58              | P(X2)  | Red illumination level meter display                         |
| 14              | 5G    | counter-2 digit grid       | 59              | P(S12) | NORMAL tape transcription limit display plate                |
| 15              | P(Y2) | min display plate          | 60              | P(S13) | CrO <sub>2</sub> tape transcription limit display plate      |
| 16              | P(Y3) | sec display plate          | 61              | P(S14) | METAL tape transcription limit display plate                 |
| 17              | 4G    | Counter-1 digit counter    | 62              | NP     | -  |
| 18              | P(L6) | Lch [-3] dB display plate  | 63              | NP     | -  |
| 19              | P(L5) | Lch [-5] dB display plate  | 64              | NP     | -  |
| 20              | P(L4) | Lch [-7] dB display plate  | 65              | 3G     | -  |
| 21              | 3G    | -                          | 66              | 2G     | -  |
| 22              | P(L3) | Lch [-10] dB display plate | 67              | 1G     | -  |
| 23              | P(L2) | Lch [-15] dB display plate | 68              | P(L7)  | Lch [-1] dB display plate                                    |
| 24              | P(L1) | Lch [-20] dB display plate | 69              | P(L8)  | Lch [0] dB display plate                                     |
| 25              | NP    | -                          | 70              | P(L9)  | Lch [+1] dB display plate                                    |
| 26              | P(S1) | BIAS display plate         | 71              | P(L10) | Lch [+3] dB display plate                                    |
| 27              | P(S2) | LEVEL display plate        | 72              | P(L11) | Lch [+5] dB display plate                                    |
| 28              | P(S3) | CALIBRATION display plate  | 73              | P(L12) | Lch [+8] dB display plate                                    |
| 29              | NP    | -                          | 74              | 1G     | -  |
| 30              | 3G    | -                          | 75              | P(S15) | TAPE display plate   |
| 31              | P(S4) | AUTO TUNING display plate  | 76              | P(S16) | SOURCE display plate   |
| 32              | P(S5) | — display plate            | 77              | P(S17) | MONITOR display plate  |
| 33              | P(S6) | MEMORY display plate       | 78              | P(Z3)  | PAUSE/MUTE display plate                                     |
| 34              | P(S7) | REFERENCE display plate    | 79              | P(Z2)  | REC display plate  |
| 35              | NP    | -                          | 80              | P(Z1)  | PLAY display plate   |
| 36              | NP    | -                          | 81              | NP     | -  |
| 37              | NP    | -                          | 82              | 1G     | -  |
| 38              | P(R1) | Rch [-20] dB display plate | 83              | 2G     | -  |
| 39              | 3G    | -                          | 84              | NP     | -  |
| 40              | P(R2) | Rch [-15] dB display plate | 85              | F      | Filament   |
| 41              | P(R3) | Rch [-10] dB display plate | 86              | F      | Filament   |
| 42              | P(R4) | Rch [-7] dB display plate  |                 |        |  |
| 43              | P(R5) | Rch [-5] dB display plate  |                 |        |  |
| 44              | P(R6) | Rch [-3] dB display plate  |                 |        |  |
| 45              | P(S8) | DOLBY NR display plate     |                 |        |  |

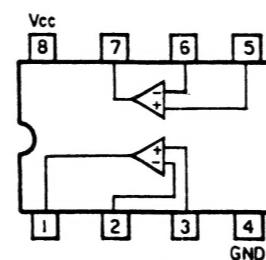
## SCHEMATIC DIAGRAM OF CTS UNIT



1S2076  
1N34A



2SC2320E / F



**μPC358C  
LA6458DS**

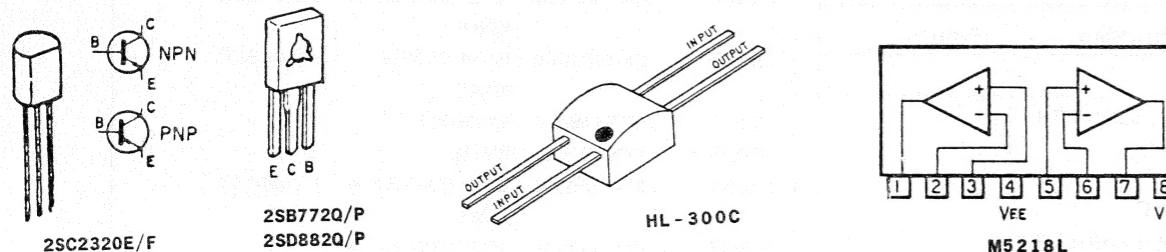
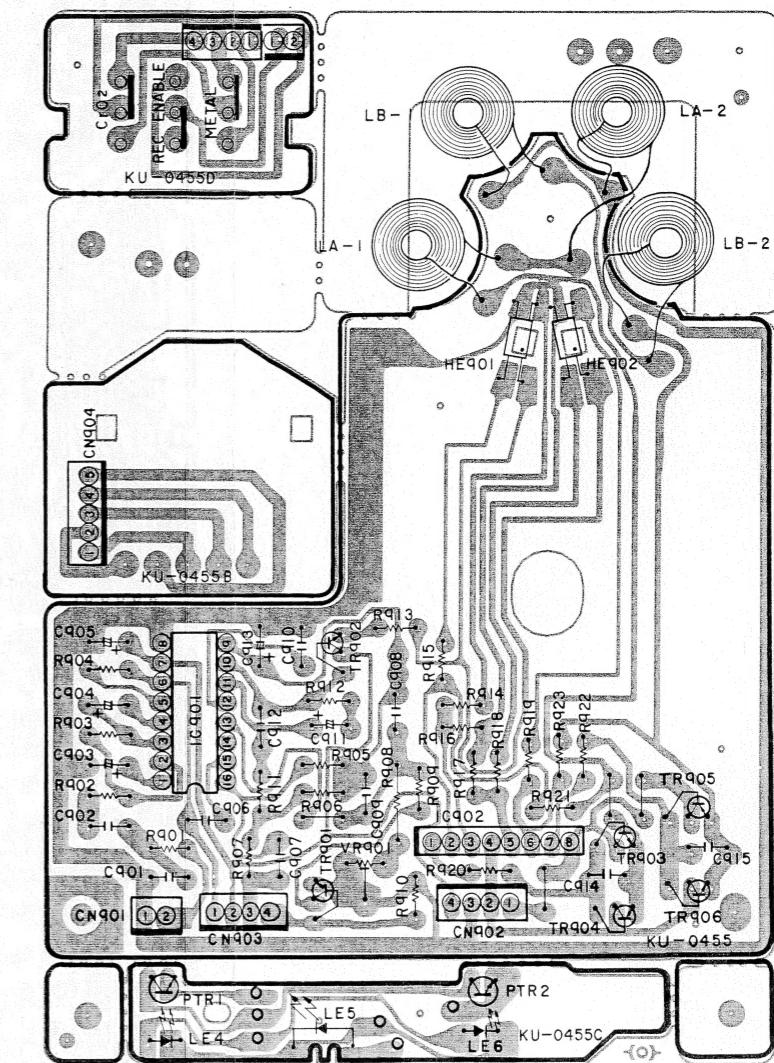
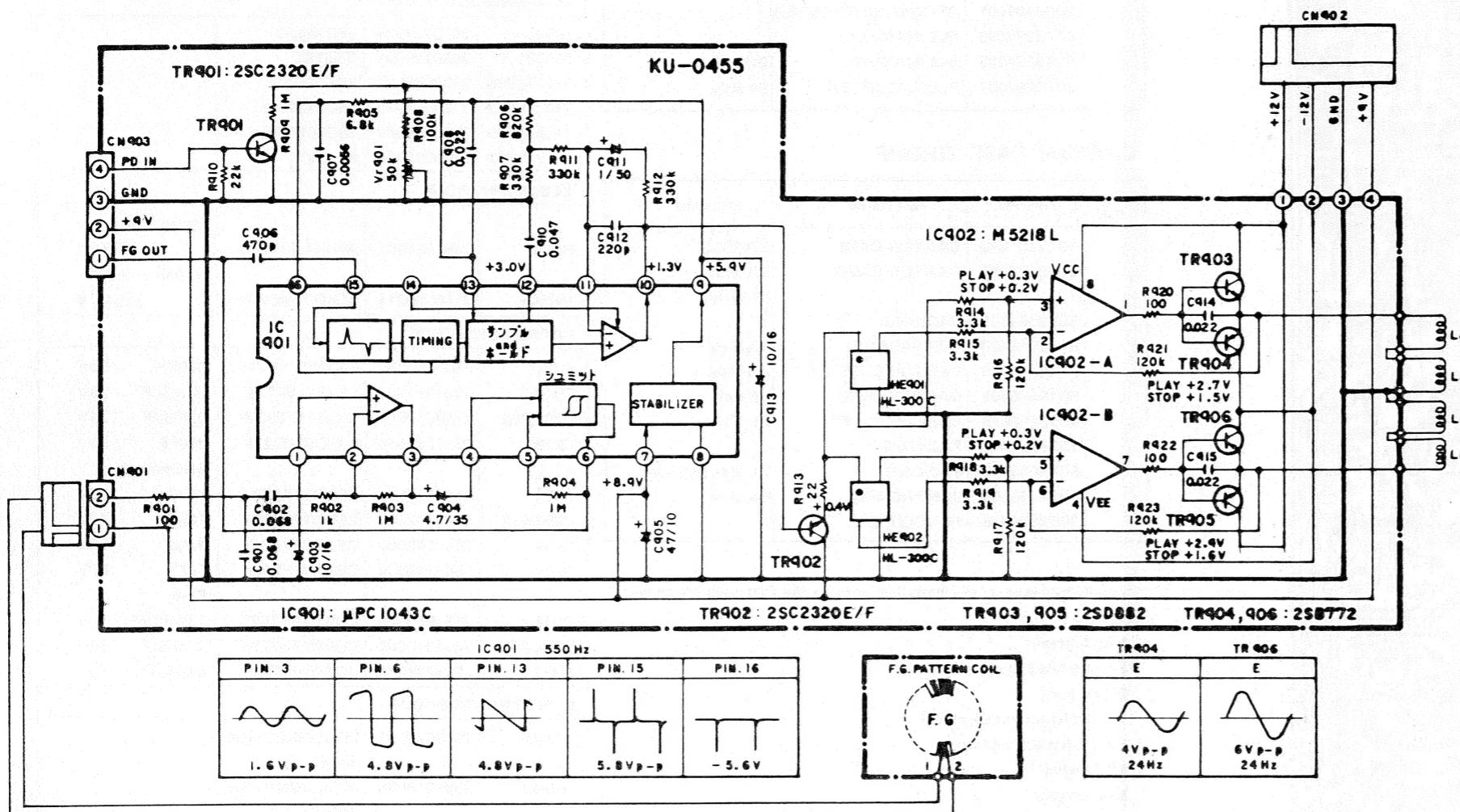
**Note:**

- Resistance shall be  $1/4W$  unless otherwise specified and the unit is  $\Omega$ .
- The unit of capacitor is  $\mu F$ ,  $P$  is  $pF$  unless otherwise specified.
- This circuit diagram shows the basic circuit. It is subject to change for the purpose of improvement.

SCHEMATIC DIAGRAM OF CAPSTAN SERVO UNIT

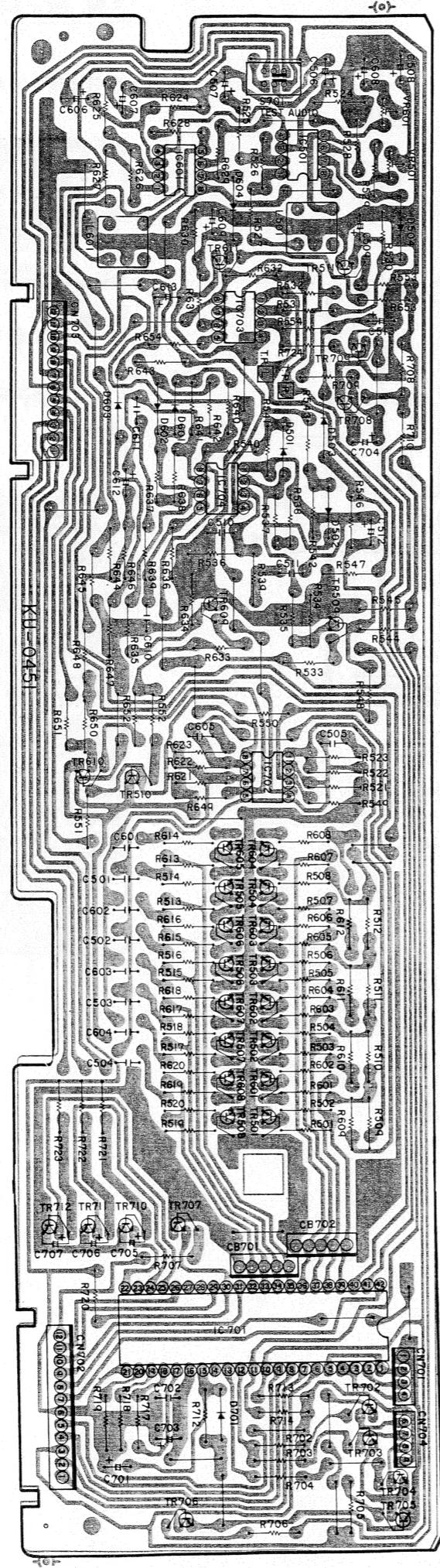
P.W. BOARD

KU-0455-1 CAPSTAN SERVO UNIT



Note: • Resistance shall be 1/4W unless otherwise specified and the unit is  $\Omega$ .  
• The unit of capacitor is  $\mu$ F, P is pF unless otherwise specified.  
• This circuit diagram shows the basic circuit. It is subject to change for the purpose of improvement.

KU-0451-1 CTS UNIT



## ACCESSORIES GROUP

| Ref. No. | Part No.   | Part Name         | Remarks |
|----------|------------|-------------------|---------|
|          | 2032101001 | 2P CONNECTOR CORD |         |
|          | 5118276006 | INS. MANUAL       |         |
|          | 5118274105 | INS. MANUAL       | EU only |
|          | 2033667007 | PLUG ADAPTER      | E1 only |

## CARTON CASE GROUP

| Ref. No. | Part No.   | Part Name   | Remarks         |
|----------|------------|-------------|-----------------|
|          | 5018291042 | CARTON CASE | DR-M33          |
|          | 5018308045 | CARTON CASE | DR-M33          |
|          | 5038054007 | PACKING     | EA only         |
|          | 5038049009 | SUB PACKING | EA only         |
|          | 5018291055 | CARTON CASE | DR-M44          |
|          | 5018346007 | CARTON CASE | EA only         |
|          | 5018298016 | CARTON CASE | E1, EU only     |
|          | 5038054007 | PACKING     | EA only         |
|          | 5038048107 | PACKING     | E1, EA, EU only |
|          | 5038049009 | SUB PACKING | EA only         |
|          | 5058006048 | ENVELOPE    |                 |

Remarks symbols in the parts list refer to the following countries and areas.

EA: Australia  
EK: United Kingdom  
EU: U.S.A.  
E1 : Multiple voltage model  
E2 : European continent  
EF: French  
EG: German  
EC: Canada

## KU-5100 MECHANISM P.W.B. UNIT

| Ref. No.                 | Part No.   | Part Name           | Remarks |
|--------------------------|------------|---------------------|---------|
| <b>OTHER PARTS GROUP</b> |            |                     |         |
|                          | 2031638054 | 2P EI CON WITH WIRE |         |
|                          | 2035691000 | 3P EI CON WITH WIRE |         |
|                          | 2050185067 | 6P WIRE HOLDER      |         |
|                          | 2129201005 | SLIDE SWITCH        |         |
|                          | 3939178000 | LN25RCP             |         |
|                          | 3939026000 | PN150               |         |
|                          | 2041630026 | 5P EI CON WITH WIRE |         |
|                          | 2123331201 | ROTARY ENCODER      |         |

• The carbon resistors rated at  $\frac{1}{4}W$  are not listed herein.

## KU-0455-1 CAPSTAN SERVO UNIT

| Ref. No.                   | Part No.   | Part Name           | Remarks  |
|----------------------------|------------|---------------------|--|
| <b>SEMICONDUCTOR GROUP</b> |            |                     |  |
| IC901                      | 2630224005 | $\mu$ PC1043C       |  |
| IC902                      | 2630189001 | M5218L              |  |
| TR904,906                  | 2720055029 | 2SB772Q/P           |  |
| TR901,902                  | 2730204035 | 2SC2320E/F          |  |
| TR902,905                  | 2740078031 | 2SD882Q/P           |  |
| HE901,902                  | 2760303016 | HL-300C             |  |
| <b>RESISTOR GROUP</b>      |            |                     |  |
| R908                       | 2452231001 | RN14K2E104G         | Metal film<br>100K $\Omega$<br>Variable resistor |
| VR901                      | 2116020011 | K08Q06MB503         | 50K $\Omega$ B                                   |
| <b>CAPACITOR GROUP</b>     |            |                     |  |
| C906                       | 2533643000 | CC45SL1H471J        | 470PF 50V  |
| C910                       | 2539013003 | CK45=1E473M         | 0.047 $\mu$ F 25V                                |
| C901,902                   | 2539014002 | CK45=1E683M         | 0.068 $\mu$ F 25V                                |
| C912                       | 2531055056 | CK45B1H221K         | 220PF 50V  |
| C905                       | 2544129005 | CE04W1A470=         | 47 $\mu$ F 10V                                   |
| C903,913                   | 2544132005 | CE04W1C100=         | 10 $\mu$ F 16V                                   |
| C904                       | 2544140000 | CE04W1V4R7=         | 4.7 $\mu$ F 35V                                  |
| C911                       | 2544146004 | CE04W1H010=         | 1 $\mu$ F 50V                                    |
| C907                       | 2551069006 | CQ93M1H562K         | Film<br>0.0056 $\mu$ F 50V                       |
| C914,915                   | 2551076002 | CQ93M1H223K         | 0.022 $\mu$ F 50V                                |
| C908                       | 2554194046 | CQ93P1H223J         | 0.022 $\mu$ F 50V                                |
| <b>OTHER PARTS GROUP</b>   |            |                     |  |
| CN901                      | 2032075001 | 2P CONNECTOR BASE   |  |
| CN902                      | 2031639008 | 4P EI CON WITH WIRE |  |
| CN903                      | 2035622024 | 4P MINI CONN. PIN   |  |
| CN904                      | 2041630000 | 5P EI CON WITH WIRE | KU-0455B   |
| CN905                      | 2041632008 | 6P EI CONNE WIRE    | KU-0455C   |
| LE4,6                      | 3939178000 | LN25RCP             | "  |
| PTR1,2                     | 3939026000 | PN150               | "  |
| CN906                      | 2031638038 | 2P EI CON WITH WIRE | KU-0455D   |
| CN907                      | 2031639024 | 4P EI CON WITH WIRE | "  |

• The carbon resistors rated at  $\frac{1}{4}W$  are not listed herein.